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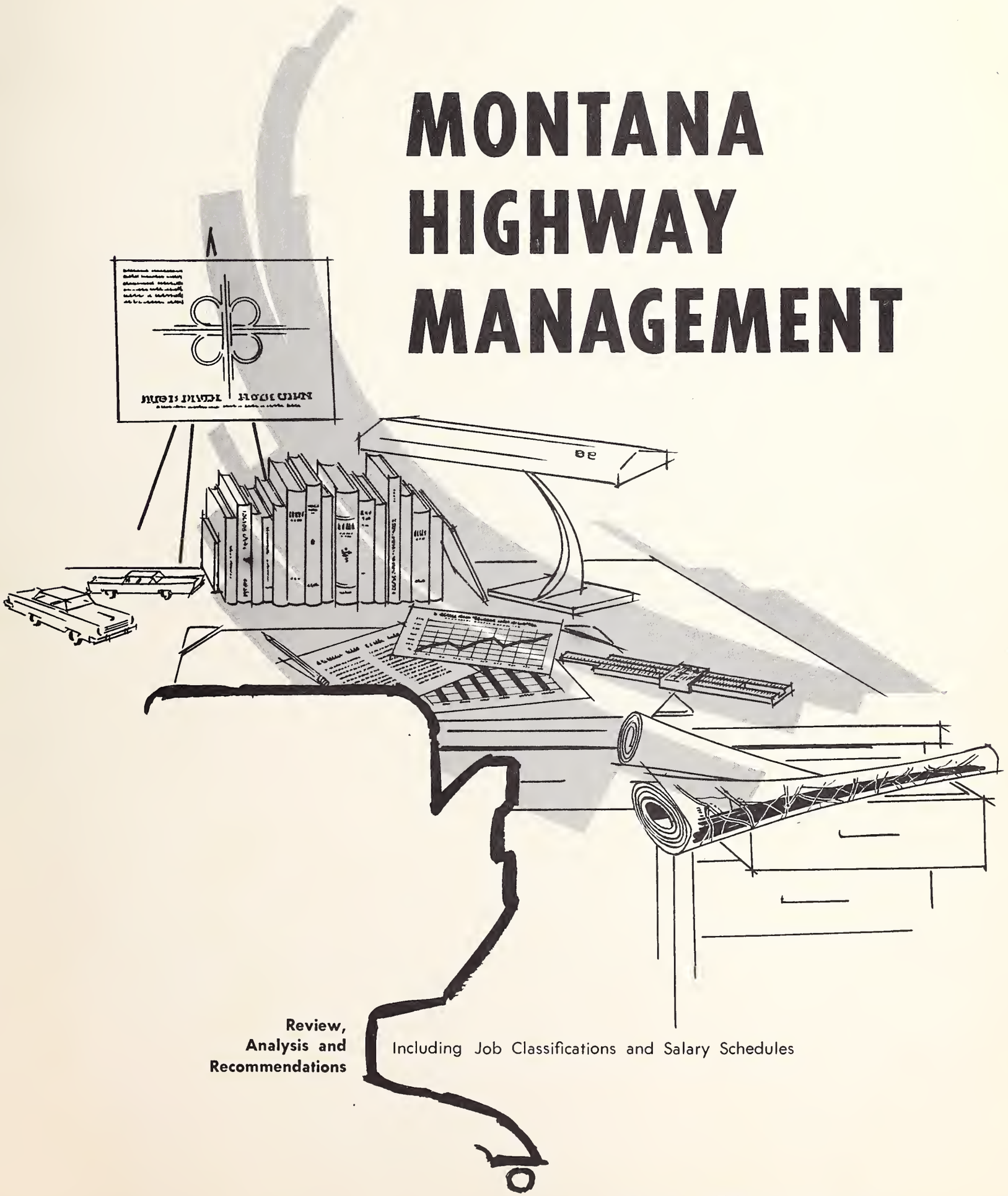
MONTANA HIGHWAY MANAGEMENT



Review, Analysis and Recommendations

Including Job Classifications and Salary Schedules

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MONTANA

HIGHWAY MANAGEMENT

REVIEW, ANALYSIS AND RECOMMENDATIONS

including

JOB CLASSIFICATIONS AND SALARY SCHEDULES

A Report to the

MONTANA HIGHWAY COMMISSION

Prepared by

Roy Jorgensen and Associates · Highway Management Consultants

Washington, D. C.

APRIL 15, 1962

TIM BABCOCK
Governor of Montana

MONTANA HIGHWAY COMMISSION

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S. N. HALVORSON, *Vice-Chairman*

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ROY JORGENSEN AND ASSOCIATES
Highway Management Consultants

7805 OLD GEORGETOWN ROAD
WASHINGTON 14, D. C.

April 15, 1962

Montana Highway Commission
Helena, Montana

Gentlemen:

In submitting this report of our review and appraisal of the Montana Highway Department, we want to emphasize several points.

This type of critical review by an outside agency has become an accepted practice of forward-looking businesses -- both public and private. In no sense should the emphasis on needed changes or new approaches be viewed other than as constructive suggestions to an organization bent on self-improvement.

The Montana Highway Commission is to be commended not only for undertaking a study of this kind but also for the latitude given the Consultants and the cooperation extended by all members of the Commission and Highway Department personnel.

In implementing recommendations contained in the report, it is suggested that this be done on a deliberately scheduled basis. While some recommendations might be readily effected, others are of a nature that will require considerable time and careful scheduling.

We appreciate this opportunity to have worked for the Montana Highway Commission and want particularly to express our thanks for the fine spirit of cooperation and helpful assistance extended to us by everyone involved.

Respectfully submitted,

Roy E. Jorgensen

Introduction

This report deals with the Montana Highway Commission and operating Department. The purpose of the report is to present the findings of an objective review, appraisal and analysis of the operations of the Commission and the Department, and to provide specific recommendations for management improvement—all designed to enable the Department to function with maximum effectiveness and economy.

OBJECTIVES OF THE STUDY

The specific objectives of the study—so stated in the agreement between Commission officials and the Consultants—were as follows:

1. *To review the organizational relationships in the Department, the duties and responsibilities of positions, and the experience and training requirements for individual jobs;*

2. *To review the job classifications and salary schedules of the Department; and*

3. *To make a report of the review to the Commission and the Department, which report shall include recommendations for job classifications and salary schedules covering all positions, and recommendations developed as a result of the review of organizational relationships.*

METHODS OF THE STUDY

The study consisted of two major phases:

1. *Review and analysis of job classifications and salary schedules.*

2. *Review and analysis of organizational operations and relationships.*

While these two aspects of the study were related, the differences in the methodology of review and analysis dictated that they be conducted separately, particularly during the early stages. The methodology of each phase is described below.

Job Classifications and Salary Schedules

The basic approach to this analysis was to gather data regarding job classifications and salary schedules from similar operating organizations in Montana and adjacent states and compare them with classifications and schedules of the Highway Department, and to conduct interviews with department and section heads of the Highway Department to determine position and job duties, authorities, responsibilities and relationships with other functions. During the latter step approximately 50 Department employees were interviewed.

Comparative position, wage and salary data were gathered from the following sources:

1. *Nine state highway departments—Arizona, Colorado, Utah, Idaho, Nebraska, Oregon, South Dakota, Washington and Wyoming.*

2. *Approximately 150 business firms operating in Montana (each with 50 or more employees).*

3. *Other state agencies in Montana, including the Game and Fish Department, the Unemployment Compensation Commission and the Welfare Department.*

4. *Montana county road agencies.*

Organizational Operations and Relationships

The basic approach in effecting this phase of the study was to interview departmental personnel and to examine records and documents. The following steps were conducted:

1. *Preliminary Review—Approximately three weeks were devoted to this step. The purpose was to determine problem areas of greatest improvement opportunity. All District Engineers and approximately 60 per cent of the Division Engineers, Office Managers and Office Engineers were interviewed, as were all department heads in the Helena office.*

2. *Two-day Workshop Conference—The purpose of this workshop was to concentrate the attention of the total top management group of the Highway Department upon management problem areas of the Department.*

3. *Analysis and Follow-up Interviews—During this step the Consultants began to correlate factual data gathered previously and to develop tentative conclusions. Follow-up interviews were conducted with selected Department officials, and records, manuals and other sources of information were reviewed to the extent possible.*

4. *Development of Final and Firm Conclusions and Recommendations—During this step four persons assigned to the project by the Consultants spent an entire week together in Helena. The primary purpose was to "firm up" previous findings and tentative conclusions and to correlate both major phases.*

PLAN OF THE REPORT

The findings, conclusions and recommendations from the study are presented in this report. All major recommendations are listed in summary form beginning on the next page.

A proposed action program for management improvement is presented in Chapter Six.

Chapter Five is devoted to wage and salary administration. In addition, further discussion and detailed data on job classifications and salary schedules—including classification specifications—are contained in another volume presented to the Commission as a supplement to this report.

SUMMARY OF RECOMMENDATIONS

CHAPTER ONE: Organizational Relationships

1. Formulate a clear statement of the basic goals and objectives of the Commission and the Department. (Page 2.)

2. Clearly define the responsibilities, authority, duties and relationships of the Commission and the Department. (Page 2.)

3. Develop a set of general operating policies. (Page 4.)

4. Establish an Executive Committee composed of the State Highway Engineer and the functional unit heads who report directly to him. (Page 5.)

CHAPTER TWO: Organizational Structure and Administrative Practices

1. Conduct the operations of the Department in accordance with the principles governing the operation of a line-and-staff type of organization. (Page 8.)

2. Create a staff position of Assistant to the State Highway Engineer. (Page 11.)

3. Establish a direct line of authority from the Director, Bureau of Operations to each District Engineer. (Page 11.)

4. The State Highway Engineer should practice delegation of responsibility and authority to a high degree. (Page 11.)

5. Place the Right of Way Attorneys directly under the authority of the Right of Way Engineer. (Page 12.)

6. The Commission Attorney should report directly to the Commission and act in a staff capacity to the State Highway Engineer and the Right of Way Engineer. (Page 12.)

7. Clearly define—in written form—the responsibilities, authority and relationships of headquarters units. (Page 13.)

8. Clearly define—in written form—the responsibilities, authority and relationships of districts. (Page 13.)

9. Establish the five geographical districts as the administrative units for field operations. (Page 14.)

10. Make provision for recognition of the Montana Department of Highways, or the Montana Highway Department, as distinguished from the State Highway Commission of Montana. (Page 16.)

11. Provide a clear organizational nomenclature to designate organizational units of the Department. (Page 18.)

12. Develop an organization guide for the Department. (Page 18.)

13. Practice the downward delegation of responsibility and authority throughout the Department. (Page 19.)

14. Increase the utilization of staff meetings, conferences and other face-to-face contacts as communication devices and techniques. (Page 20.)

CHAPTER THREE: Personnel Management

1. Maintain a continuous analysis of the Department's managerial and supervisory personnel needs—and of personnel available to fulfill these needs. (Page 27.)

2. Plan and conduct a systematic recruiting program. (Page 27.)

3. Develop a performance appraisal system designed to improve managerial and supervisory performance. (Page 29.)

4. The Personnel Branch should constantly analyze training needs of the Department and provide staff guidance and leadership in satisfying these needs. (Page 30.)

CHAPTER FOUR: Planning and Control

1. Establish a Bureau of Planning and Administrative Research to meet the need for development of long-range programs, priority schedules, performance standards, control measures and other administrative research. (Page 31.)

2. The Bureau of Planning and Administrative Research should initiate a maintenance function research project. (Page 32.)

3. The Bureau of Planning and Administrative Research should initiate a continuing highway needs appraisal. (Page 35.)

4. The Bureau of Planning and Administrative Research should initiate an analysis of accident records to provide measures of the safety associated with highway modernization and to guide improvement scheduling in the interest of safety. (Page 36.)

5. The Bureau of Planning and Administrative Research should undertake projects to provide guidance to top management in establishing over-all policies, defining key position descriptions and carrying forward a management manpower development program. (Page 38.)

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CHAPTER ONE

ORGANIZATIONAL RELATIONSHIPS

It is axiomatic that an organization exists to accomplish specified goals and objectives. These goals and objectives should provide daily focus and guidance to the efforts of the total organization.

Goals and objectives should be developed at all levels of the organization, and by each organizational unit, to guide its endeavors. However, before the lower-level units can develop objectives there must be broad over-all goals and policies. The development of these is a major task of top management.

Top management in the Montana Highway Commission and operating Department presently consists of the following:

1. The Commission—five members.
2. The chief executive of the Department—the State Highway Engineer.
3. Heads of major functional units or departments—Bridge Engineer, Technical Engineer, Maintenance Engineer, Administrative Engineer, Right of Way Engineer and Personnel Manager.

The major tasks of top management in an organization are two: (1) to formulate and communicate the goals and objectives of the organization, and (2) to provide the over-all direction, appraisal and control of the efforts and activities of the organization.

During the course of the review and analysis of organizational relationships in the Highway Commission and the Department, it became evident that there is a need for more precise definition of organizational responsibilities of, and relationships among, various levels of the organization.

In this chapter, particular attention is devoted to the following:

1. Commission-Department responsibilities and relationships.
2. Responsibilities and relationships of the State Highway Engineer.

Commission-Department Responsibilities and Relationships

The law does not strictly define the responsibilities, authority, duties and relationships of the Commission and the Department.[1] The statutes provide for a five-member Commission and a State Highway Engineer to serve at the pleasure of the Commission. The statutes further provide that the State Highway Engineer "shall perform any acts or duties relating to the office of the Highway Commission which said Commission may, from time to time, impose upon him."

The tenor of the statutes—as well as traditional operations of the Commission and the Department—seems to be that the five-member Commission has full responsibility for, and authority over, highway affairs in Montana. However, since it is a part-time Commission—normally meeting only once each month—it seems clear that the Commission must, of practical necessity, delegate a large measure of responsibility and authority for administration of Department operations to the State Highway Engineer. This it has traditionally done.

During discussions with the Commission as a group, as well as with some individual members, it was apparent that the necessity and desirability of delegation of a large measure of responsibility and authority for Department operations to the State Highway Engineer is well recognized. Discussions with top officials of the Department also indicated that such delegation is necessary and desirable.

Theory of organization operations supports the concept that the Commission should delegate responsibility and authority for Department operations to the State Highway Engineer, and properly concern itself with the formulation of over-all goals and policies, and over-all direction, guidance, appraisal and control of operations. Theory also supports the concept that the chief executive—the State Highway Engineer—should be held responsible and accountable for results of operations of the Department.

Thus, there appears to be no problem or conflict between the Commission, the State Highway Engineer and top officials of the Department as to the necessity and desirability of the basic philosophy of Commission-Department relationships described in the preceding paragraphs. However, the Department has grown so rapidly during the last decade, and its operations have become so complex,

[1] For purposes of clarity in this report, the term "Commission" refers to the five-member Commission, and the term "Department" refers to the operating organization. There is no statutory provision for a Highway Department as differentiated from the Commission.

that there is a pressing need to take definite steps to implement the philosophy that the Commission should assume responsibility for the formulation of broad basic objectives and policies, and over-all direction, appraisal and control of operations; and that the State Highway Engineer should be delegated responsibility and authority to administer operations of the Department, and be held responsible and accountable for results.

The major steps necessary to adequately implement the above-described philosophy in a formal and usable manner are recommended and discussed in the following sections.

RECOMMENDATION NO. 1

Formulate a Clear Statement of the Basic Goals and Objectives of the Commission and the Department.

The Highway Commission should develop a clear—and complete—statement of its objectives to serve as a guide to the Department in its efforts. As an example of what is necessary, rather definite and complete answers to such basic questions as the following should be developed in written form:

1. What should be the relationship of the highway program in Montana to such factors as the economic, social and cultural development of the State?
2. What, specifically, are the long-range highway improvement objectives of the Department? The short-range?
3. What objectives and standards for maintenance should be established?
4. What sort of financial planning—and program—is necessary to achieve the objectives set out for accomplishment?
5. What sort of public—and legislative—information program is necessary to assure wide knowledge and support of the highway program?
6. What are the requirements to assure an adequate organization and personnel to accomplish the objectives of the Department?

In effecting the foregoing recommendation, it will be found that the initial endeavor will not be as explicit in defining programs and setting objectives as would be desirable. Nonetheless, a start should be made using the best judgment of the Commission and the recommendations of the Department staff.

The inability to define objectives more explicitly at this time will point up the need for some of the other recommendations in this report—particularly the recommendations associated with an expanded planning and administrative research activity (see Chapter Four).

The basic aims and objectives of the Commission and the Department should be written and distributed to key people in the Department and affected parties outside the Department. Provision should be made, however, for updating and revision to provide an over-all Department guide which is current and as complete as possible at all times.

RECOMMENDATION NO. 2

Clearly Define the Responsibilities, Authority, Duties and Relationships of the Commission and the Department.

This recommendation supplements the previous recommendation and is the second major step necessary to adequately implement the Commission-Department philosophy described in the first section of this chapter. In implementing the definition of the Commission-Department responsibilities, authority, duties and relationships, the following guides are suggested:

1. The Commission, a body ultimately responsible to the people of Montana for all highway matters, cannot—of course— divest itself of this responsibility. However, it can—and should —formally delegate to the chief executive of the Department (the State Highway Engineer) the responsibility and commensurate authority for accomplishing, through the Department, the basic goals and objectives formulated by the Commission and the Department staff.
2. The basic philosophy of Commission-Department relationships should be that the Commission, in cooperation with the State Highway Engineer and his staff, should formulate realistic goals, objectives and broad basic policies—in effect, specifying desired results— and delegate to the State Highway Engineer the responsibility and authority to achieve these results. In so doing, the Commission should assist and support the State Highway Engineer in his activities, but

should avoid interference with the processes or methods he uses—as long as they are within the intent and spirit of the basic policies established by the Commission.

3. The State Highway Engineer, with the assistance of his staff, must develop and establish a system of management control and reports so that he can effectively (1) report progress and status of Departmental operations and programs to the Commission for its review, appraisal and approval, and (2) direct and control the operations of the Department.
4. The State Highway Engineer, with the support of the Commission, must develop a capable, efficient and cooperative organization, and a team of managers, to achieve the basic objectives of the Commission.
5. The relationship between the Commission and the State Highway Engineer and his staff must be one of mutual support and cooperation to achieve the established goals and objectives.

In an organization as large and as complex as the Montana Highway Commission, formal written statements covering the subjects discussed above are essential basic elements in effective Commission-Department operations. Basic objectives—when clearly stated and communicated to the operating organization—provide a necessary guide to the organization and all its constituent units. It is only through such guides that the efforts of the organization can be properly coordinated. Unless they exist, a possible result will be a "crisis" or "fire-fighting" type of operation.

Definition of the responsibilities, authority, duties and relationships of the Commission and the Department are necessary to prevent "overlapping" in these areas. Unless such definition exists, there may be instances when the Commission, or individual members of it, discuss operational matters with department or section heads, or District personnel, and make operational decisions without proper communication with the State Highway Engineer—the official ostensibly responsible for such operational aspects. Conversely, there could be instances in which the State Highway Engineer, or members of his staff, set policies or take other actions pertaining to matters properly in the realm of the Commission's responsibilities—or in which the State Highway Engineer, or his staff, do not effectively inform the Commission of the status of operations. The definition of responsibilities, duties, authority and relationships of the Commission and the Department should minimize such occurrences.

The clear definition of the responsibilities, authority, duties and relationships of the Commission and the Department is a task which will require a considerable amount of time and thought on the parts of the Commission, the State Highway Engineer and his staff. Such definition is essential, however, if the Commission and the State Highway Engineer are to operate effectively.

In summary, the definition should require the Commission to act in areas of broad objective and policy formulation, over-all review, appraisal and control of operations, and the provision of leadership in highway matters in Montana; and the State Highway Engineer should be held accountable for results and be delegated the responsibility and authority to achieve them. If the results achieved by the Department are not satisfactory to the Commission, it then is in a position to take necessary corrective action to assure adequate and satisfactory performance.

Responsibilities and Relationships of the State Highway Engineer

The State Highway Engineer should be considered, in all respects, as the chief administrative executive of the Department. In considering the responsibilities, authority, duties and relationships of this top management function, there should be a clear concept of the division of work between the functions of the Commission—formulation of over-all basic objectives and policies, and over-all review, appraisal and control of Department operations and activities—and the function of administration, which is that of the State Highway Engineer.

As it has been emphasized above, the State Highway Engineer is the chief executive of the Department. As such he should be ultimately responsible and accountable for all operational aspects of the Department and must be given the necessary authority to perform adequately. His responsibility and authority derives from the Commission, which should clearly delegate them to him. As in the case of the Commission, the State Highway Engineer cannot divest himself of the responsibilities of his position, but he can—and should—delegate downward responsibility and authority for the performance of defined functions.

It is essential that the chief executive not become engrossed in details of operations. His is an administrative function and, therefore, he must devote his efforts to the over-all planning, organizing and controlling of the operational activities of the Department. He must develop a sound organizational

plan with well-defined functions and duties, and competent personnel, and *practice delegation of authority and responsibility to functional units within the organization.* He then must hold unit managers accountable for the results of operations of their units. Unless the State Highway Engineer practices such delegation, he inevitably will become engrossed in making decisions on matters that should be made by his subordinates—and will not be performing the task of over-all administration and coordination which he properly should.

A major means by which the State Highway Engineer should achieve effective direction, coordination and control of Department operations is through general operating policies. Just as the Commission should establish broad over-all basic goals, objectives and policies to guide the total highway program, so should the State Highway Engineer see to it that general operating policies and procedures —which conform to, and implement, the basic objectives and policies of the Commission—are established to guide daily operations of the Department. These policies and procedures should guide the decisions of unit heads at all levels in the organization—particularly in repetitive situations.

RECOMMENDATION NO. 3

Develop a Set of General Operating Policies.

At the present time the Department does not maintain a formal policy manual, as such. The communication of top management directions to operating units has been achieved in several ways: letters, memoranda and directives, through discussion at staff meetings or conferences, and through telephone or face-to-face communications. Practice regarding formal recording and communication of verbal decisions has varied.

During the course of the study, the need for review, revision and general up-dating of operating policies became apparent—particularly in the districts. Over a long period of time letters, memoranda and directives regarding operational aspects have collected until they compose a considerable mass of material—some of it out-dated and superseded. Consequently, it is cumbersome, exasperating and time-consuming to use.

In implementing this major recommendation, the following guides are suggested:

1. The State Highway Engineer should, with the approval and support of the Commission, direct that a manual containing operating policies and procedures be developed.
2. The primary responsibility for developing the format and coordinating the development of the manual should be assigned to the Director, Bureau of Administration. This individual must work with other Bureau Directors to assure full participation by all units.
3. The State Highway Engineer should see that a comprehensive format for the manual is laid out. The format should include sections for the following major areas, and appropriate items within each:
   a. General.
   b. Administration.
   c. Personnel.
   d. Planning and Research.
   e. Maintenance.
   f. Construction.
   g. Design.
   h. Engineering.
   i. Others that may be determined appropriate.
4. The manual should be designed in loose-leaf, indexed form to facilitate additions and deletions.
5. *All* existing policies must be reviewed, appraised and either revised, eliminated or included in the manual. In instances where no written policies are in effect, yet should be, they should be written and included.
6. Once the manual is completed, the State Highway Engineer should see that all unit managers keep their copies up to date, and that policy directives are followed.

The policy manual described above should not be confused with the basic policies of the Commission which were discussed previously. The latter are very broad in nature, while the operating policies and the procedures to be included in the manual are more specific. Also, the policy manual should not be confused with such manuals as the Right of Way Procedures Manual, the Cost Accounting Manual and others of this nature. The latter treat technical subjects while the operating policies and procedures are intended to treat administrative aspects—thus satisfying a different need.

The development of a set of general operating policies will make it possible for the State Highway Engineer to practice delegation to a greater extent than has been possible heretofore. Such policies

provide an element essential to delegation of responsibility and authority to subordinates. In effect, policies let unit managers know the "rules of the game," so to speak. With the knowledge provided by them, each unit manager can make decisions with assurance that he has the authority to do so. It is apparent that such policies will provide a basis for consistency of decisions and actions throughout the Department.

A major task of the State Highway Engineer should be the coordination of the activities of the major functional units of the organization toward achievement of the goals and objectives of the Department. It is extremely important that the State Highway Engineer and the functional unit heads work together as a coordinated team. In order to do this there must be a high degree of communication and planning among the members of the "team"—who are the operational quarterbacks of the Department.

The following recommendation is made to facilitate communications and planning at the top operating level of the Department:

RECOMMENDATION NO. 4

Establish an Executive Committee Composed of the State Highway Engineer and the Functional Unit Heads Who Report Directly to Him.

The basic purpose of the Executive Committee is to provide a means of communication and coordination among the State Highway Engineer and the functional units heads who report directly to him. Actually, the Committee would consist, then, of six persons. It is through these functional heads that the State Highway Engineer must carry on his administrative functions of planning, organizing, directing, controlling and evaluating.

At the present time a staff meeting is held regularly once each week among key headquarters personnel. No regular agenda is prepared and the meeting is not presided over regularly by the State Highway Engineer. It is attended by approximately a dozen persons. It is used largely as a vehicle for discussion of problems, and sessions often take considerable time. While these staff meetings serve a useful purpose, they fall short of the purposes for which the Executive Committee is recommended.

In effecting the Executive Committee, the following guides should be used:

1. Regular meetings should be held at least every other week, with additional meetings scheduled as needed.
2. An agenda should be prepared for each meeting. Any member of the Committee should be able to place items on the agenda, which should be recorded by the secretary (or assistant) of the State Highway Engineer. The agenda should be circulated to members of the Committee at least two days before the regular meeting.
3. Only matters of top-level importance should be placed on the agenda.
4. Executive Committee meetings should take precedence over all activities except unavoidable conflicts.
5. Meetings should be held to a maximum of one and one-half hours. The agenda should be followed.
6. Meetings should be regularly presided over by the State Highway Engineer.
7. Meetings should be participative in nature.
8. Members of the Executive Committee compose the top management operating team. This Committee's activities should serve as an effective device to orient the major functional unit heads, and the activities of their units, to the over-all goals and objectives of the Department.

The recommendations contained in this chapter are intended to serve as necessary basic "starts" toward management improvement in the Highway Department. They deal primarily with relationships among top management levels. In Chapter Two organizational structure and administrative practices are considered—both of which are closely related to the areas treated above.

CHAPTER TWO

ORGANIZATIONAL STRUCTURE AND ADMINISTRATIVE PRACTICES

The Montana Highway Department has, as do many organizations of its size and complexity, a number of operating problems. Some of these arise as a result of the organizational structure and administrative practices that prevail. These problems, and the recommendations designed to alleviate them, cannot be fully understood without some knowledge of what has happened in the organization in the past. Consequently, a brief review of the recent history and the present structure is presented before the discussion of recommended changes.

Recent History of the Organization

Until 1957 the Department's organizational philosophy was one of rather strong centralization of authority. There were 11 construction divisions and 11 maintenance divisions, each headed by a divisional construction or divisional maintenance engineer. Functional authority, highly centralized in headquarters units, flowed from the State Highway Engineer through the State Construction Engineer to divisional construction engineers, and from the State Highway Engineer through the State Maintenance Engineer to divisional maintenance engineers.

In 1957 the State Highway Engineer, with the concurrence of the Commission, instituted a change in organizational philosophy and structure. The change in philosophy was from centralization of authority in headquarters to decentralization of responsibility and authority to districts. At the same time the field units were reorganized into five geographical districts, each headed by a District Engineer. The latter was given responsibility and authority for both construction and maintenance, acquisition of right of way and, in some instances, design of secondary roads.

The new philosophy was that the line of authority would flow directly from the State Highway Engineer to each District Engineer, and that headquarters units would act in a staff capacity and report directly to the State Highway Engineer. Further, District Engineers were to be responsible "for all activities in the districts" and have a high degree of responsibility and authority.

As a result of the reorganization described above, and subsequent changes, the present plan of organization of the Highway Commission has evolved and is shown in Figure 1. Under this plan the State Highway Engineer, the Commission Attorney, the Advertising Director, the State Parks Director and the Commission Secretary report directly to the Commission.

From the standpoint of the operation of the Department, the State Highway Engineer and the Commission Attorney are the persons primarily involved. The Commission Attorney is the immediate superior of the attorneys engaged in activities related directly to the acquisition of right of way for highways.

Below the position of State Highway Engineer the Department is organized essentially on a functional basis. There are six major functional units at the present time, headed by the Bridge Engineer, the Administrative Engineer, the Technical Engineer, the Maintenance Engineer, the Right of Way Engineer and the Personnel Manager. Each such unit head is responsible for a variety of personnel and functions, as follows:

ADMINISTRATIVE ENGINEER

Secondary Roads Engineer
Training-in-service Engineer
Planning Survey Manager
Chief Accountant
Office Engineer
Data Processing Engineer
G.V.W. Tax Supervisor
Processing and Photography Supervisor
Office Services Supervisor

BRIDGE ENGINEER

Assistant Bridge Engineer (Construction)
Assistant Bridge Engineer (Design)

TECHNICAL ENGINEER

Construction Engineer
Project Control Engineer
Pre-construction Engineer
Interstate Engineer
Materials Engineer

ORGANIZATION CHART

STATE HIGHWAY COMMISSION OF MONTANA

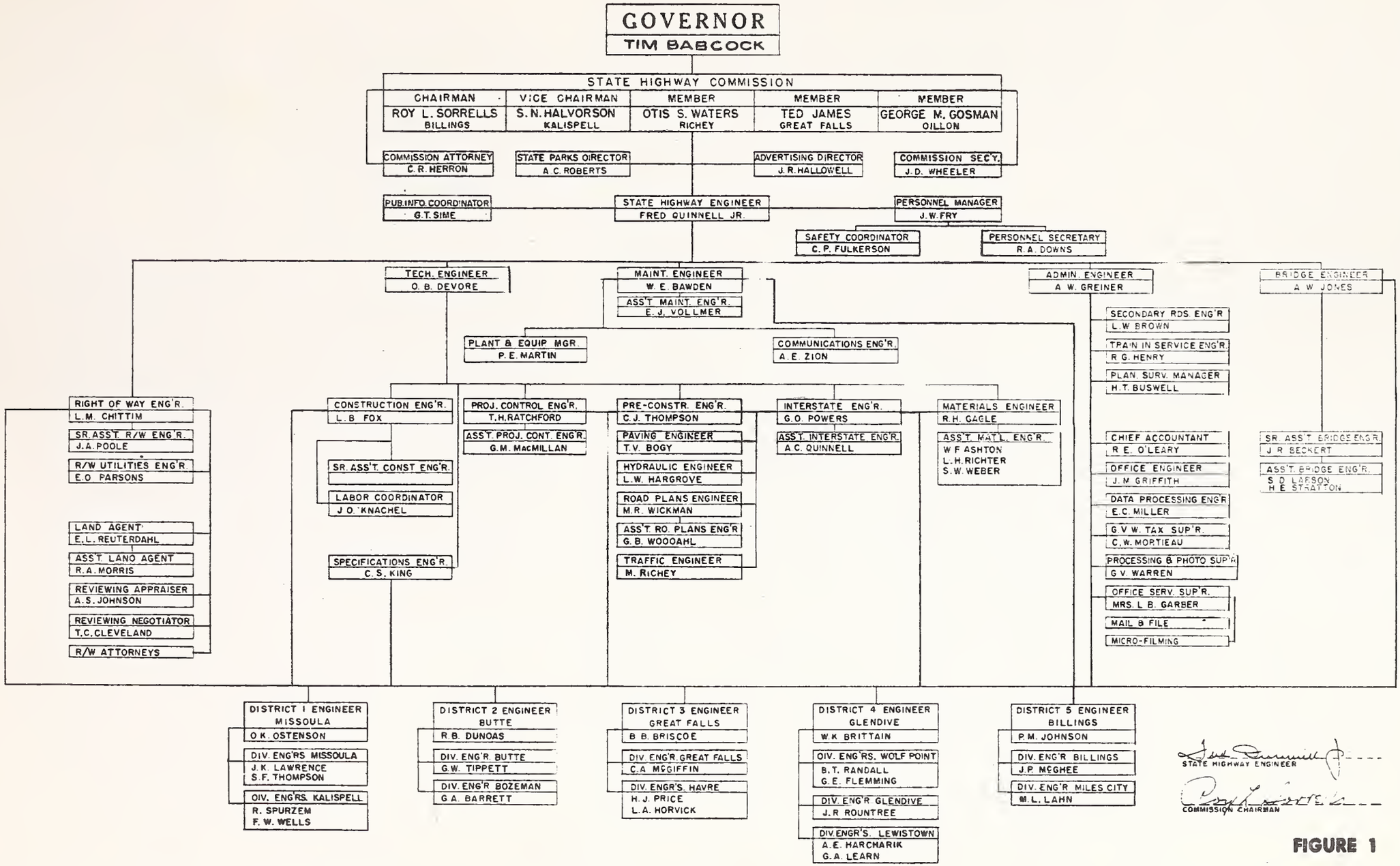


FIGURE 1

RIGHT OF WAY ENGINEER
Right of Way Utilities Engineer
Land Agents
Reviewing Appraisers
Reviewing Negotiators

MAINTENANCE ENGINEER
Plant and Equipment Manager
Communications Engineer

PERSONNEL MANAGER
Safety Coordinator
Personnel Secretary

The line operations in the field are conducted through five geographical districts, each headed by a District Engineer. Each district handles contract construction, maintenance betterments, general maintenance, acquisition of right of way and, to a very small extent (in some districts), design of secondary roads.

The process of reorganization, particularly when it includes a change in fundamental operating philosophy and major structural changes—as was the case in Montana in 1957, can be expected to create many problems and "kinks" as it proceeds. This has occurred in the Highway Department, and many of the problems have been solved successfully.

However, during the period since 1957 while the reorganization process was going on, there also has been a marked increase in construction and related activities in the Department. The fact that this great increase in activities has taken place during the same period that the Department was undergoing reorganization has compounded the problems associated with the latter process.

As a result, a number of operating problems do exist. These are, broadly, as follows:

1. There is need for clear definition of responsibilities, authority, duties and relationships of headquarters and district units.
2. There is need for regrouping of functional units in the central office in Helena in order to facilitate coordination and communication.
3. There is need for structural changes in the districts in order to achieve greater uniformity and consistency in their operations.

Recommended Plan of Organization

This brief review of the recent history of the Department has revealed several organizational problems which can be alleviated by certain changes in structure and administrative practices. In the following sections a series of recommendations, designed to fulfill the needs described above, are discussed.

RECOMMENDATION NO. 1

Conduct the operations of the Department in accordance with the principles governing the operation of a line-and-staff type of organization.

In order to effect this recommendation, it is recommended that the plan of organization structure depicted in Figures 2 and 3 be adopted. In this organization the line of responsibility and authority should run directly from the State Highway Engineer to each of the Bureau Directors—the Bureau of Engineering, the Bureau of Administration, the Bureau of Bridge Design and Construction, the Bureau of Planning and Administrative Research and the Bureau of Operations. The direct line of authority to districts should run directly from the Director, Bureau of Operations to each District Engineer. The five bureaus should be staff units and the districts should be line operating units.

Grouping of Activities in Headquarters Units

The recommended plan of organization contains a somewhat different grouping of related activities in headquarters units than does the present organization. These changes are recommended to alleviate some of the operating problems that now exist. The recommended structure is discussed below.

BUREAU OF ENGINEERING—The activities grouped in this bureau are closely related and require maximum coordination to be most effectively performed. These activities are, with the exception of bridge design, the major activities of the pre-construction phase of construction. Thus, the Director, Bureau of Engineering will have direct authority over, and responsibility and accountability for,

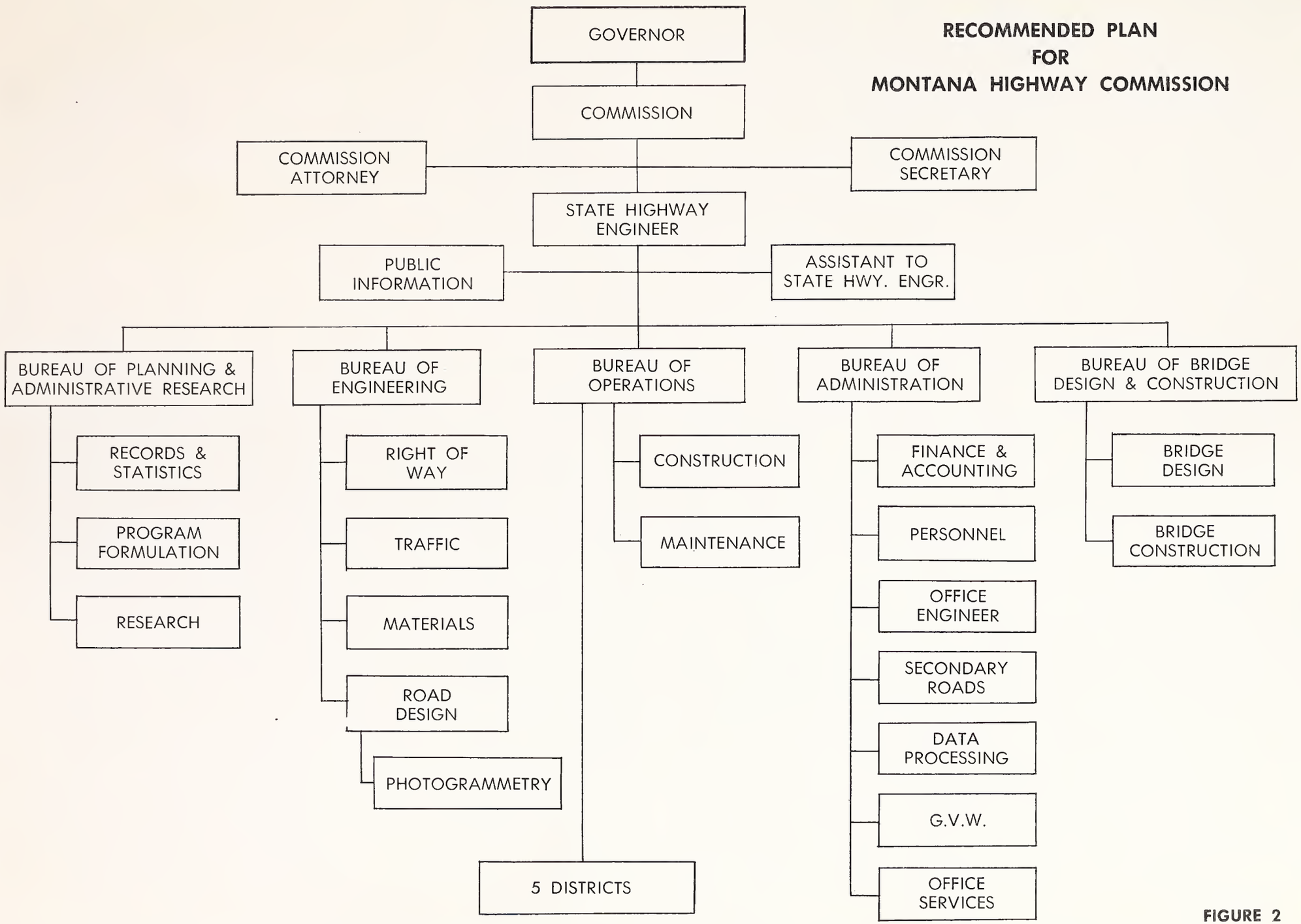

RECOMMENDED PLAN
FOR
MONTANA HIGHWAY COMMISSION
GOVERNOR
COMMISSION
COMMISSION ATTORNEY
COMMISSION SECRETARY
STATE HIGHWAY ENGINEER
PUBLIC INFORMATION
ASSISTANT TO STATE HWY. ENGR.
BUREAU OF PLANNING & ADMINISTRATIVE RESEARCH
BUREAU OF ENGINEERING
BUREAU OF OPERATIONS
BUREAU OF ADMINISTRATION
BUREAU OF BRIDGE DESIGN & CONSTRUCTION
RECORDS & STATISTICS
PROGRAM FORMULATION
RESEARCH
RIGHT OF WAY
TRAFFIC
MATERIALS
ROAD DESIGN
PHOTOGRAMMETRY
CONSTRUCTION
MAINTENANCE
5 DISTRICTS
FINANCE & ACCOUNTING
PERSONNEL
OFFICE ENGINEER
SECONDARY ROADS
DATA PROCESSING
G.V.W.
OFFICE SERVICES
BRIDGE DESIGN
BRIDGE CONSTRUCTION

FIGURE 2

most of the major functions of the pre-construction phase and can effectively coordinate and control these activities.

A major change of the recommended plan of organization is the placement of the right of way function in the Bureau of Engineering. The basis for this change is the recognition of right of way acquisition as a functional activity of the pre-construction phase and the necessity for coordination of its activities with other pre-construction operations.

Under the existing plan of organization the activities included in the recommended Bureau of Engineering are, in some instances, spread out over the organization in such a manner that there is some difficulty in coordinating and communicating across departmental lines. Unless related activities are closely grouped as recommended, there is a strong possibility that the lines of authority may not be clear, and confusion will result.

Under the recommended plan of organization, project control will become a part of the routine of the Bureau of Engineering. In effect, the planning and control of this bureau's operations will incorporate the present function of "project control," and this function will be a direct responsibility of the Director of the Bureau.

BUREAU OF ADMINISTRATION—The placement of activities in this bureau recognizes a group of staff functions that are "specialized" and, except for finance and accounting, are primarily service staff in nature. The finance and accounting function is more nearly a control staff function.

A major characteristic of the activities grouped under the Bureau of Administration is that, for the most part, they should not be *decentralized* to a high degree due to their service and control nature.

A major change in the grouping of activities in the Bureau of Administration is the placement of the personnel function within it. Under the present plan of operation the Personnel Manager reports directly to the State Highway Engineer. Furthermore, the training function—an activity very closely related to the personnel function—is now under the Administrative Engineer. It is recommended that the training function be under the direction of the Chief, Personnel Branch. This arrangement will facilitate proper direction, coordination and control of these closely related personnel activities.

BUREAU OF BRIDGE DESIGN AND CONSTRUCTION—From a logical standpoint, it might be thought that these functions should be grouped with those in the Bureaus of Engineering and Operations. However, the bridge design and construction functions presently operate with great effectiveness and very little difficulty of coordination. Furthermore, the bridge design and construction activities require a high degree of technical skills and abilities, and are very specialized. These are the major reasons why these functions are grouped in a bureau-level activity. Organization should not be static, however, and at some propitious time in the future consideration should be given to the integration of these functions into the Bureau of Engineering and Operations.

BUREAU OF PLANNING AND ADMINISTRATIVE RESEARCH—At the present time the advance planning and administrative research activities of the Department are not given the attention necessary to provide adequate guidance to top management. Accomplishment of many of the management improvements recommended in the first three chapters of this report is dependent on the effectiveness with which the Bureau of Planning and Administrative Research is organized to furnish factual guidance. To a large degree, this bureau must do the "homework" for the Commission and top management of the Department.

A number of recommendations are made in Chapter Four which indicate the breadth and importance of this new bureau's activities.

BUREAU OF OPERATIONS—The recommended establishment of this bureau recognizes the basic operational functions and objectives of the Department—construction and maintenance. A major characteristic of these functions in the Department is that they can be *decentralized* to the districts to a high degree. Nevertheless, there is a great need for *uniformity* in the standards and final results of these activities. Thus, the Director, Bureau of Operations has line authority over district operations, but he has staff assistance from the heads of construction and maintenance. It is through the Bureau of Operations that the necessary uniformity of procedures and standards in districts can be achieved.

STATE HIGHWAY ENGINEER—Under the present plan of organization the State Highway Engineer must engage in a great variety of time-consuming activities. In addition to serving as chief adminis-

trative executive of the Department, he also is the chief engineering officer. He must, of necessity, devote a considerable part of his time to receiving delegations, handling correspondence, working with the Commission, aiding in public relations activities and other similar duties. Over a period of time, and with the increased volume of work in the Department, his activities have become so numerous that he has relatively little time to devote to over-all planning, organizing and controlling of Department operations—the chief tasks of an administrator at this level.

In order to remedy this situation, the three following recommendations are made:

RECOMMENDATION NO. 2

Create a staff position of Assistant to the State Highway Engineer.

It should be clearly understood that the person in this position has no line authority over any function, but acts in a staff capacity *to* the State Highway Engineer. This person should not even be considered as the person to act as State Highway Engineer in the latter's absence.

The Assistant to the State Highway Engineer should relieve the chief executive of many small time-consuming details such as gathering information needed by the latter to answer correspondence or meet delegations, assisting in scheduling activities of the State Highway Engineer, accompanying his chief on inspection trips and so on.

The ideal type of person to fill this position would be a young engineer who shows promise of advancing to high position in the Department. This would be an excellent opportunity for such an individual to gain knowledge and experience and the over-all view so necessary to top-level administration. Such training would be invaluable. However, it should be policy that the term in this position would be limited to a certain period of time—preferably two to three years, and that the incumbent would be reassigned to another position the Department, in keeping with his abilities and tenure, at the end of that period.

RECOMMENDATION NO. 3

Establish a direct line of authority from the Director, Bureau of Operations to each District Engineer.

The establishment of a direct line of authority from headquarters to the districts, as recommended above, provides that the Director, Bureau of Operations—not the State Highway Engineer—be the direct superior of District Engineers. It is essential that the State Highway Engineer delegate to the Director, Bureau of Operations a large degree of responsibility and authority for performance of this function. This function should not in any way be construed as one in which the Bureau Director is considered to be the assistant state highway engineer—it is a function which stands by itself on the same level as the other major bureaus.

RECOMMENDATION NO. 4

The State Highway Engineer should practice delegation of responsibility and authority to a high degree.

As the chief administrative executive of the Department, the State Highway Engineer must free himself of operating details in order that he may devote his energies to administrative matters—over-all planning, direction and control of the highway program and operations of the Department. He must delegate to the Directors of Bureaus the responsibilities, authority and accountability for the performance of clearly-defined functions.

In carrying on his activities, the State Highway Engineer should rely heavily on his immediate staff—the Directors of Bureaus. His is the task of directing and coordinating the activities of these bureaus toward the accomplishment of the objectives of the Department.

COMMISSION ATTORNEY—Under the present plan of organization the Commission Attorney reports directly to the Commission. He also is the direct superior of attorneys engaged full-time in right of way activities for the Department. This arrangement violates a very fundamental principle of organization, i.e., the Right of Way Engineer is ostensibly responsible for all right of way activities in the Department, yet he does not have direct authority and control over all the personnel engaged in

these activities, and—for that matter—neither does the chief administrative officer of the Department, the State Highway Engineer. The result is that the responsibility for operations in right of way matters is placed on the Right of Way Engineer through the State Highway Engineer, *but neither of them has the necessary authority and control over personnel performing these tasks.*

To rectify this situation, the following recommendations are made:

RECOMMENDATION NO. 5

Place the Right of Way Attorneys directly under the authority of the Right of Way Engineer.

RECOMMENDATION NO. 6

The Commission Attorney should report directly to the Commission and act in a staff capacity to the State Highway Engineer and the Right of Way Engineer.

The basis for these two recommendations is that the Commission Attorney actually serves as legal counsel and attorney to the Commission, which has authority over State functions other than the Highway Department. Therefore, the Commission Attorney should report directly to the Commission.

However, insofar as highway affairs are concerned, the attorneys who perform in the right of way function should be responsible to the State Highway Engineer—who is responsible for operations and results of the Department—through the Right of Way Branch in the Bureau of Engineering. The Commission Attorney should act only in a staff capacity to the Department in respect to right of way matters. One of the right of way attorneys should be designated as Chief Right of Way Attorney under the Chief, Right of Way Branch to assure competent handling of legal aspects of right of way matters in the Department.

These recommendations, when effected, should prevent any delays in right of way matters and proceedings which have previously been occasioned by the separation of organizational responsibility and authority in these areas. They will not, however, completely avert delays in right of way proceedings occasioned by heavy work loads or lack of sufficient lead time in schedules.

Responsibilities, Functions and Relationships of Headquarters Units

The headquarters bureaus in the recommended plan of organization should, as a whole, act in a staff capacity to (1) the State Highway Engineer, (2) the Department as a whole, and (3) the districts. It should be clearly understood, however, that the Director, Bureau of Operations exercises direct line authority over districts, but should delegate a large measure of authority and responsibility to District Engineers.

The responsibilities and relationships of headquarters units can be better understood and effected in day-to-day operations if the following concepts—fundamental to a decentralized line-and-staff organization—are recognized and understood:

1. Decentralization of authority must have some limits and controls, i.e., policy and procedure guidance, direction, and control must be exercised by top management of the Department (top management includes the Commission, the State Highway Engineer and Bureau Directors).
2. Some activities properly should be *decentralized* to a high degree. Primarily, these are construction and maintenance. This means that districts should exercise free initiative in these activities, subject to general policy and procedure direction and control of the Department regarding standards, uniform procedures and final results. Initiative in the formulation of such policies and procedures should be taken by the State Highway Engineer and the Director, Bureau of Operations in coordination and communication with the District Engineers and other Bureau Directors.
3. Some activities should be *decentralized* to an intermediate degree. These are right of way, design and materials. In these activities the districts should be subject to more precise direction and control by central office specialists than is the case in maintenance and construction.
4. Some activities should be *centralized* in nature. These are finance and accounting, personnel, data processing, planning research, programming and scheduling. In these activities the districts are subject to rather precise instructions by specialists in the central office.

Decentralization of responsibility and authority in an organization of the size and complexity of the Highway Department cannot be complete—*it can only be to a degree.* Unless this concept is recognized and provided for, it can lead to serious operating problems.

For example, different District Engineers might interpret their responsibilities, authority and relationships with headquarters units differently. In some instances District Engineers might feel that they have complete and total responsibility and authority for *all* activities and, thus, not accept or follow policies or directives of headquarters units. Conversely, some District Engineers might rely too heavily on headquarters units and not assume as much responsibility and authority as they should. In either event, operations will not be as smooth and effective as desirable and frictions probably will develop.

Another example of adverse results that may occur because of lack of conformance to the basic principles of decentralized operations, as discussed above, is that there may be a lack of uniformity of understanding among headquarters unit managers as to their responsibilities, authority and relationships with district units. As a result there may be poor coordination, impossible deadlines and open friction between headquarters and field personnel.

In order to avoid such adverse results, the Department should implement the following recommendations:

RECOMMENDATION NO. 7

Clearly define—in written form—the responsibilities, authority and relationships of headquarters units.

RECOMMENDATION NO. 8

Clearly define—in written form—the responsibilities, authority and relationships of the districts.

The Department presently does not have any sort of manual or other written instrument which clearly defines the responsibilities, authority and relationships of headquarters units and district units. There are position classifications which describe the type of functions and duties of individual positions—but these are primarily for the purpose of wage and salary classifications and schedules. They are not intended for, nor will they serve the purposes of, provision of operational guidance and coordination to and among organizational units. There are some written procedures which, in effect, assign responsibilities for certain activities to particular units. In some headquarters units—notably Right of Way and Bridge Design—there are written functional descriptions for their particular activities.

Responsibilities, authorities and relationships of headquarters and district units have, for the most part, been developed in a rather informal manner—often as the result of discussion and agreement between various personnel and at staff meetings. While such discussion and agreements are commendable steps, it is essential—in an organization that has grown as large and as complex as the Highway Department—that responsibilities, authorities and relationships be formally defined and recorded. It is only in this way that complete understanding and consistency of action can be achieved by all organizational units and personnel concerned.

Organizational Plan of the Districts

In general, districts are organized with a District Engineer as the chief executive of each. The next lower elements are the division engineer level, resident engineer level, and project engineer and maintenance superintendent level.

The field organization structure was affected to a great degree by the reorganization undertaken in 1957. The changes were intended to accomplish the following:

1. To establish five districts as field administrative units with a District Engineer at the head of each. Formerly, there had been, in effect, 22 administrative units—11 division construction units and 11 division maintenance units.
2. To decentralize (authority-wise) the operational aspects of the Department and place more responsibility and authority in the District Engineers. District Engineers were given greater responsibilities and authority for operations in the districts.

The changes in philosophy of authority and structure were rather great departures from the organization that had previously existed. As was expected, operating problems accompanied the change. Many of these have been solved, but some still exist. The major existing problems are:

1. The transfer of administrative responsibility and authority from divisions to districts has not been completely accomplished. Major reasons for this are:
   (a) The normal supporting functions of the district administrative unit were not established around the district unit. Rather, they were established for the Division Engineer's function. For example, there are Division Office Managers, Division Office Engineers and Division Maintenance Supervisors, rather than District Office Managers, District Office Engineers and District Maintenance Supervisors. Also, there are Division Engineers—the same title as formerly used, and in some instances the same persons are Division Engineers in the same locations.
   (b) As a result of (a) above, there is a tendency for some field and headquarters personnel —perhaps unconsciously and unknowingly—to still view the divisions as the operating administrative units in the field. As a result, communications between headquarters units and field units sometime bypass the District Engineer's office, and other routine types of communication that probably should not go through the District Engineer's office do so. Methods, procedures and channels of communication between headquarters units and districts tend to vary with personalities of individuals involved.
2. The lines and channels of authority and communication between headquarters and districts are not clearly defined nor understood. In some discussions with headquarters personnel and field personnel it was understood that the line of command authority to districts runs directly from the State Highway Engineer; in other instances it was felt that command authority to the districts extend from various headquarters units. The functions of some units in headquarters, and their responsibilities and authority, were not clearly understood by some headquarters and district personnel.
   (a) Examination and analysis of the present organization chart, depicted in Figure 1, reveals that it does less than an adequate job of guiding Department personnel interested in determining lines of authority and communication. For example, if the chart is read and interpreted literally each District Engineer has a minimum of eight different headquarters units from whom he ostensibly could receive command instructions. It is recognized, of course, that this would indicate a functional type of organization. Some misunderstanding exists, however, in this respect. Some officials apparently feel that the functional type of authority is desirable and does exist, while others feel the chart does not reveal the true nature of authority that does exist. There are instances in which these officials actually operate in accordance with their feeling and beliefs as to the authority that does, or should, exist.

The major factors that should be recognized from the above analysis are (1) the organization is actually operating in a manner different from that intended, and (2) a major cause of the difficulty is the lack of clear definition of responsibilities, authority and relationships of districts.

To partially remedy the problems defined above, the following recommendation is made:

RECOMMENDATION NO. 9

Establish the five geographical districts as the administrative units for field operations.

The emphasis in this recommendation is that the present geographical districts be set up as *true administrative units*. Under the present plan of organization, the divisions are more nearly the major administrative units in the field than are the districts.

The recommended plan of organization for districts is depicted in Figure 3. This plan accomplishes the following.

1. A clear line of command authority is established from the Director, Bureau of Operations to each District Engineer.
2. Each district is established as a complete administrative unit. This is accomplished by (1) establishing Assistant District Engineer positions for the major functions of construction and maintenance, (2) establishing a District Office Manager position, (3) establishing a District

Office Engineer position where necessary, (4) establishing a District Right of Way Supervisor position, and (5) abolishing the Division Engineer position, as such, as well as the title.

In establishing the districts as administrative units, major consideration must be given to providing flexibility to the organization because of the large geographical area contained in each district. Adequacy and closeness of supervision of activities are other major considerations, as well as provision for the development and training of personnel.

In effecting the recommended plan, the following guides should be used:

1. District Engineer—The District Engineer is the chief administrative officer of the district. As such, his major task is coordinating and directing the district activities in conformity with policies and directives of the Department, interpreting Department policies and directives and putting them into action in his district, and maintaining close coordination and cooperation with headquarters units. He is, in the final analysis, responsible and accountable for all activities and results in his district.
2. District maintenance function—The District Engineer should delegate to the Assistant District Engineer (Maintenance) the responsibility and authority for coordination and direction of all maintenance activities in the district. The District Engineer should, with the advice and assistance of his staff, establish district maintenance policies and procedures—conforming to and implementing general policy and procedural controls established by top management of the Department—to guide and control district maintenance operations.
   (a) The physical facilities at present division points exist primarily for purposes of the maintenance function, rather than construction. The locations of these facilities dicate that the present geographically-defined maintenance areas be continued. The Assistant District Engineer (Maintenance) should place a Maintenance Superintendent in charge of each of these existing facilities. The Maintenance Superintendent should be delegated the responsibility and authority for the direction and control of the maintenance function in his geographic area. He also should be in charge of the facilities—buildings, offices, shops and maintenance equipment assigned to his area—and have an adequate complement of personnel—shop foremen, maintenance foremen, clerical personnel, etc.—to perform the functions assigned his units.
3. District construction function—The District Engineer should delegate to the Assistant District Engineer (Construction) the responsibility and authority for coordination and direction of all construction activities and operations in the district.
   (a) Unlike the maintenance function, the construction function is not necessarily "tied" to fixed physical facilities which presently exist. The Assistant District Engineer (Construction) should exercise supervision and control of construction activities through (1) Resident Engineers and (2) Project Engineers.
   (b) It is recommended that the projected construction work load be the major determinant of the location of field "residences" or semi-fixed headquarters. For example, to use the Glendive District to illustrate, if the scheduled highway construction program indicated a large volume of work over the next five or six years on either side of Jordan, or Glasgow, a residency may be established there. There may be one or more Project Engineers reporting to the Resident Engineer for supervision and guidance. The Resident would report directly to the Assistant District Engineer (Construction). As the work load changed, the residency location would change to fit the work pattern.
   (c) In other instances there may not be a concentration of construction projects as described in (b) above. Instead of assigning a Resident Engineer, the Assistant District Engineer (Construction) may wish to assign Project Engineers and have them report directly to him (the Assistant District Engineer).
   (d) The advantages of the flexible arrangement for supervision of construction activities, as described in (b) and (c) above, are:
      (1) In some instances it allows Resident Engineers and Project Engineers to establish domociles closer to the projects.
      (2) It provides an excellent arrangement for developing supervisory and managerial personnel. For example, experienced and capable Resident Engineers can supervise the activities of younger and less experienced Project Engineers and can train and de-

velop them. On the other hand, more experienced Project Engineers can be assigned to projects and report directly to the Assistant District Engineer (Construction).

4. District office function—The District Office Manager should be responsible for coordination and direction of all office functions at district headquarters. He also should be responsible that all office personnel in residencies or maintenance areas conform to established district office policies and procedures. All reports to the central office should be submitted by the district headquarters even though data are supplied by residencies and maintenance areas. The district office should be the depository for all major records and similar documents.
5. District right of way function—The District Right of Way Supervisor should be responsible for the conduct of all district right of way activities. Because of the specialized nature of this function, there should be rather precise functional staff guidance from the Right of Way Branch in Helena—however, the Right of Way Supervisor should be directly responsible to the District Engineer.
6. District Office Engineer—Because of time limitations it was not possible to analyze, in depth, the functions of District Office Engineers. There is some reason to believe that the position may not be necessary, but further analyses should be conducted before a decision is reached.

The major advantages of the proposed plan of organization are:

By establishing the district as the administrative unit and defining its responsibilities, authority and functions in terms of its being the administrative unit, the "hangover" problem associated with the former divisional administrative units—misunderstanding, lack of clarity, etc.—should be largely dispelled.

The District Engineer should be able to relieve himself of time-consuming details that now plague him. There is a clear channel of delegation to his organization, and he should practice delegation and rid himself of details that properly should be handled by his subordinates. His function should be that of coordinating the work of his district and in cooperating with headquarters units in such a manner that his district contributes its full share to the achievement of over-all objectives of the Department.

Under the proposed plan of district organization it is possible to provide competent, specialized administration and supervision of the major district activities—construction and maintenance. The establishment of two Assistant District Engineers—each with specific responsibility, authority and accountability for administration of one or the other functions—assures the degree of specialization and attention necessary to these functions.

The proposed plan provides flexibility, particularly in the supervision of construction, by contemplating the establishment of residencies close to long term projects.

Under the proposed plan of organization, it will be much easier to institute a planned program of personnel development. Assistant Division Engineers should develop into future District Engineers, or heads of headquarters units; Resident Engineers should receive valuable supervisory experience that will qualify them for future assignment to more responsible tasks, and young Project Engineers should be supervised and developed by capable Resident Engineers.

Organizational Nomenclature

At the present time there is no statutory provision for a Montana Department of Highways, as such. Legally, and technically, there is statutory provision for the Commission only.

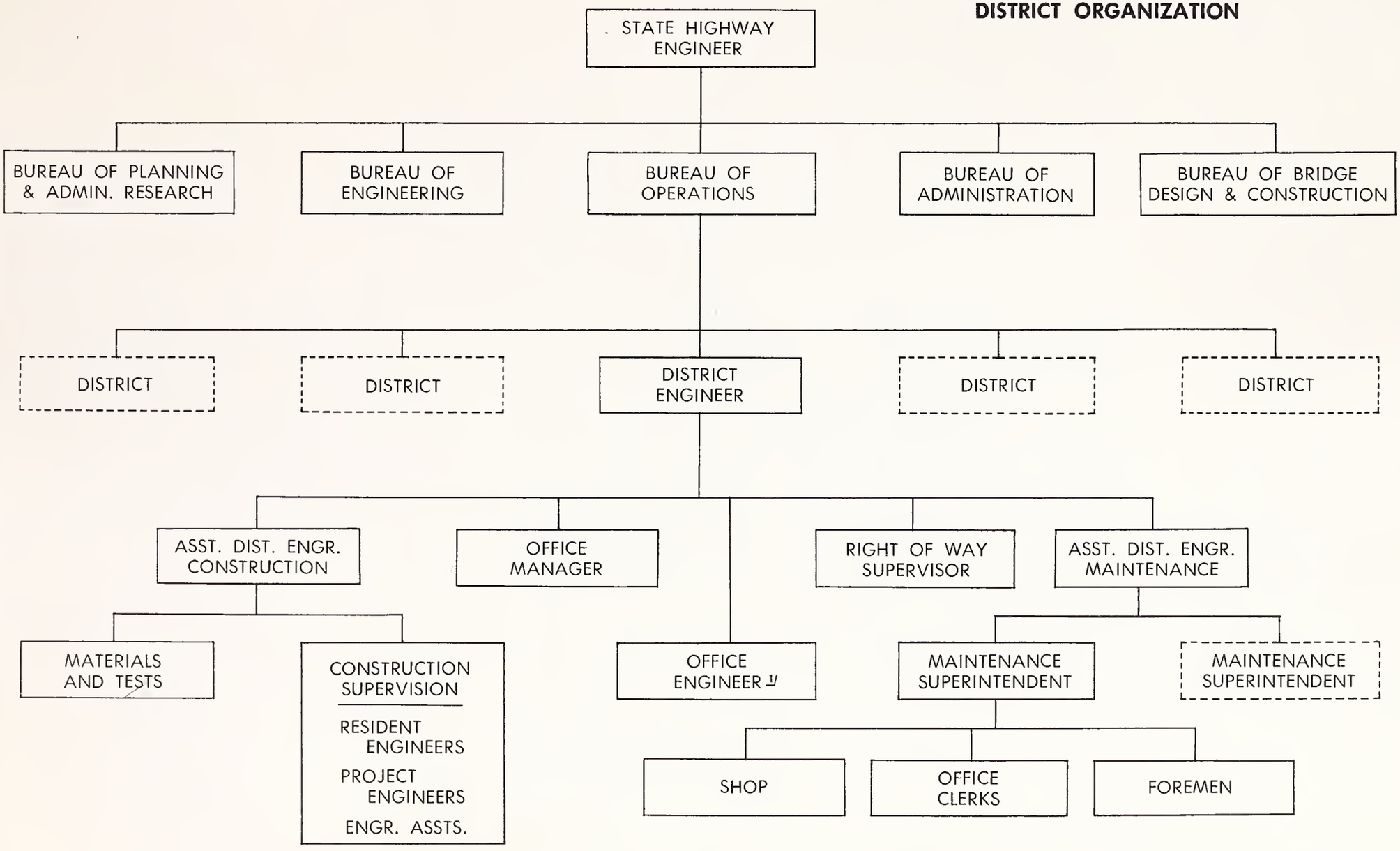
In addition, there is some lack of understanding of the proper designations of various units in the organization, i.e., should units be referred to as departments, branches, sections, bureaus or divisions.

Under the present organizational plan, there appears to be no firmly established and clear-cut organizational nomenclature. Functions are designated in terms of the title of the person heading the function—*thus placing emphasis on titles rather than functions.* This practice is in violation of a basic organizational principle, namely, that organization should be defined in terms of functions rather than persons or titles. In order to remedy this situation, the following recommendations are made:

RECOMMENDATION NO. 10

Make provision for recognition of the Montana Department of Highways, or the Montana Highway Department, as distinguished from the State Highway Commission of Montana.

RECOMMENDED PLAN FOR DISTRICT ORGANIZATION



1/If needed.

FIGURE 3

RECOMMENDATION NO. 11

Provide a clear organizational nomenclature to designate organizational units of the Department.

It may require legislative action to effect a recognition of the Department as distinguished from the Commission. The greatest advantage of such recognition would be clarity to the public and the employees of the Department.

Insofar as organizational nomenclature is concerned, the following are recommended:

1. In Headquarters at Helena
   (a) State Highway Engineer.
   (b) Assistant to the State Highway Engineer.
   (c) Bureaus—These should designate the five major functional units of the organization. Thus, Bureau of Operations, Bureau of Administration and so on. Persons heading these functions should be designated as Director, Bureau of Operations; Director, Bureau of Administration and so on.
   (d) Branches of Bureaus—The next units below the bureaus should be designated as branches. Thus, Right of Way Branch, Personnel Branch, Office Engineering Branch, Road Design Branch, etc. The titles of persons heading these activities should include the word "Chief." Thus, Chief, Right of Way Branch; Chief, Personnel Branch, etc.
   (e) Sections—The units making up the branches should be designated sections. Thus, Paving Section, Photogrammetry Section, etc. Persons heading these functions should be titled Supervisor, Paving Section; Supervisor, Photogrammetry Section, etc.
   (f) Units—In the event there are subdivisions of sections, these should be termed units. Titles of top personnel should be Head, ... Unit, etc.
2. In Districts
   (a) The main district office should be designated as district headquarters. The top engineer should be titled District Engineer.
   (b) Assistant District Engineers—Construction or maintenance, as the case may be.
   (c) District Office Manager and District Office Engineer.
   (d) District Resident Engineer and District Maintenance Superintendent.
   (e) Project Engineer, Maintenance Foreman, Shop Foreman.

When the scope of the study was defined, it was anticipated that the review of organizational structure, operations and relationships would be confined to major functional units of the organization. Even so, the Consultants reviewed the operations of subordinate units to the extent feasible and possible in view of the time limitations which existed. It should be recognized, however, that the preceding recommendations relative to organization structure are only intended to delineate *major* functions and relationships. These furnish a necessary reference point from which to proceed in defining more specifically these major functions and delineating and defining subordinate positions and their functions.

In order to implement the recommendations contained in the first two chapters, the Department should concentrate its attentions upon organization planning—with the objective of developing a well-defined total organization. To facilitate this process, the following recommendation is made:

RECOMMENDATION NO. 12

Develop an organization guide for the Department.

This is considered one of the more important recommendations to come out of the study—and one which will be most helpful to the Department when implemented.

The organization guide should be the basic—and major—tool used by the Department to completely plan and develop its organization. It will serve to effectively augment the organization plan, as depicted in the organization chart, by providing the following:

1. A formal, written delineation and definition of the responsibilities, authority, duties and principal relationships of each major organizational unit and key job in the Department.
2. The total organization plan and structure of the Department, and relationships that should exist among functional areas.

The organization guide will be a means of effecting a number of the recommendations made in the first two chapters. For example, the recommended definition of the responsibilities, authority, duties and principal relationships of both the Commission and the State Highway Engineer should be included in it, as well as the definitions of these aspects for all major functions and key positions.

The proper development of an organization guide will assure the detailed planning and placement of subordinate components of the organization—once the major functions are delineated and defined in written form. It will avoid overlapping of responsibilities and authority as well as gaps in their assignment. It also will pinpoint areas which may require special treatment to achieve maximum effectiveness.

In addition, the organization guide will provide daily operating guidance to managers and supervisors at all levels. For example, reference to it should prevent any conflicts between individuals as to who has responsibility and authority for particular functions. The guide will clearly indicate the lines of communication and coordination that should be followed in organization practice. Moreover, and probably one of its most important uses, it is of great value in executive and employee selection, training and development.

The development of an organization guide will make it possible for the Department to institute an administrative practice of great importance, namely, the practice of assigning specific responsibilities to functional units and holding unit heads responsible and accountable for results. This practice cannot be successful unless responsibilities and duties of functions are clearly defined.

Because of the importance of the recommendation that the Department develop an organization guide, a more detailed description of the steps that should be taken to properly develop such a guide is included in Chapter Six.

Administrative Practices and Communication

Underlying all the major recommendations made in the first two chapters are three fundamental prerequisites to effective management. These are:

1. The necessity for developing organization goals, objectives and operating policies.
2. The necessity for developing an over-all organization plan and structural relationships which facilitate coordination, communication and cooperation among functional units and unit managers.
3. The necessity for clear definition of responsibilities, authority, duties, functions and principal relationships of functional units and key jobs.

The above are essential to effective management. Also important in the attainment of the goal of good management is the quality of the administrative practices that are established in the Department.

Delegation

Probably the most important administrative practice that should prevail in any organization is that of downward delegation of responsibility and authority. Therefore, the following recommendation is made:

RECOMMENDATION NO. 13

Practice the downward delegation of responsibility and authority throughout the Department.

It already has been emphasized that the Commission and the State Highway Engineer should practice downward delegation of responsibility and authority. This recommendation is now made with reference to the Department as a whole.

There are two major reasons for emphasizing the practice of delegating responsibility and authority in the Department. The first is that it will free managers at every level from time-consuming details that properly should be handled by subordinates—and allow them to devote more time and attention to their proper functions of over-all operational planning, organizing and controlling. The second reason is that delegation of responsibility and authority to subordinates is the best way to develop the managerial talents and capabilities of subordinates.[1]

[1] The need for development of personnel in the Department is discussed in Chapter Three.

There are several prerequisites to effective delegation of responsibility and authority. Unless these prerequisites exist, delegation can not be practiced successfully. Some of these already have been recommended and discussed, while others will be treated in subsequent sections of this report. In order to relate these recommendations to the administrative practice of delegation—and to emphasize the importance of the latter—several prerequisites are set out, briefly, below.

1. Organization goals and objectives must be established.
2. Operating policies and procedures must be established.
3. Functions, positions and principal relationships must be clearly defined.
4. Good communication must exist.
5. Controls must be established.

Good delegation practices do not "just happen"—the above-listed prerequisites must exist. However, the very process of formulating these prerequisites will, in and of itself, encourage managers to delegate. As a result of the formulation of the prerequisites, delegation will be more likely to come about "naturally," and certainly will be more successful.

Communication

It has been said that "management is communication." Whether this is completely true or not, the fact is that effective communication is an essential element in good management. Most administrative practices are, in the final analysis, methods and techniques for achieving good communication in the organization. Thus, the administrative practices recommended below are devices and techniques for improving communication within the Montana Highway Department.

RECOMMENDATION NO. 14

Increase the utilization of staff meetings, conferences and other face-to-face contacts as communication devices and techniques.

Possibly the most effective administrative practice to improve communication within the Highway Department is to increase the use of face-to-face contacts—staff meetings, conferences and other formal or informal contacts. It is not intended to infer that such practices are completely lacking in the Department—but to point out ways in which these techniques can be more effectively utilized.

Staff Meetings

At the present time two major staff meetings are held at regular intervals. One is the weekly meeting of key headquarters staff, which already has been discussed. The other is the monthly meeting of District Engineers and headquarters unit heads. This meeting serves a very useful purpose in communicating operating plans and policies from headquarters to District Engineers, affording the latter a chance to bring up their problems for discussion and providing an opportunity for District Engineers to meet and exchange ideas and information relative to operations. This practice should be continued.

It already has been recommended that an Executive Committee be established. Its operation was discussed in Chapter One.

During the course of the interviewing step of the study, remarks of a number of individuals interviewed led to the conclusion that the institution of regular staff meetings within functional units at periodic intervals—perhaps once a month—might well improve communication in some headquarters units. The practice of holding such meetings at regular intervals varies among units. Individuals in units in which such meetings are held regularly commended the practice. It is recognized that while almost daily contact between a chief and individual members of this staff is possible, group staff meetings augment this practice and are useful in improving communication within functional units.

Another area in which it appears that regular staff meetings could be utilized more effectively is in the districts. Here the situation is somewhat different than in Helena, because of the wide geographical separation of managerial and supervisory personnel. Nonetheless, it is recommended that District Engineers institute the practice of holding well-planned staff meetings at least semi-

annually, and preferably once each quarter.[2] It would be desirable to plan staff meetings and conferences of this kind to last at least an entire day, and possibly longer if the need exists.

Conferences and Meetings

The Department should increase the utilization of well-planned one-, two- or three-day conferences and meetings for managerial and supervisory personnel—on an inter-unit and inter-district basis. Such meetings are effective means for discussing and disseminating information relative to policies and procedures, future operating plans and schedules, and new methods and procedures. They also provide an opportunity for managers to discuss operating problems and procedures and exchange information with their counterparts from other districts or units in the Department. For example, such a conference for all Office Managers in the districts would be an excellent way to assure greater understanding, and uniformity, of office procedures in field units. The subject matter treated in such inter-branch and inter-district meetings would, of course, vary with the needs.

It is recognized that meetings and conferences can be time-consuming and costly. On the other hand, they can be extremely effective administrative practices—if properly planned and conducted. They do provide opportunity for group face-to-face contacts—a most effective method of communication. Their usefulness depends largely upon how well they are planned, how well subject matter is presented and how much discussion and participation is encouraged. Few such meetings are successful if they are confined to lectures or direction, with no chance for discussion, participation and contribution by those in attendance.

Individual Face-to-Face Contacts

Another effective means of communication—and an essential one—that should be utilized to a greater degree in the Department is frequent face-to-face contacts between superiors and subordinates at every level. It is recognized that there are situations in the Department in which it is impossible for managers or supervisors to actually see, and talk to, each of his subordinates daily, or even weekly. Nonetheless, managers and supervisors at every level should conscientiously attempt to have as frequent contact with their subordinates as possible.

The superior-subordinate relationship is, in all probability, the most important relationship in an organization insofar as the effectiveness of communication is concerned. One of the more common failings of superiors is that they conceive their function as being one of only *telling* subordinates what to do. Where this attitude exists, the superior fails to *listen* to what the subordinate might have to say, or what feelings they have on any subject under consideration. The result is lack of mutual understanding and, hence, poor communication.

Written Communication

Emphasis in the preceding sections was on face-to-face communication. Such communication is largely verbal in nature and is subject, therefore, to possible distortion afterward. It is important that the habit of putting all orders, directives and instructions *in writing* be fostered in the Department,[3] thus providing necessary substantiation and documentation and ensuring clear understanding. This also will provide a written record for follow-up by managers and supervisors and the basis for a record of actions taken in compliance with instructions, directives and orders.

The purpose of this chapter is two-fold: (1) to develop a basic organization structure suitable for the Highway Department and (2) to recommend organization planning and administrative practices which should be effected. The development of a well-planned and defined organization, accompanied by enlightened administrative practices, will provide a necessary framework within which the Department can operate to a maximum effectiveness. It is emphasized, however, that the Department must have competent and highly-motivated persons in all positions if it is to achieve the high performance which is a basic goal. The next chapter, therefore, is devoted to the subject of personnel development.

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[2] It should be pointed out here that such staff meetings should not in any way diminish the desirability of frequent visits to field units by District Engineers. One of the major reasons for stressing the practice of delegation is to assure more time for District Engineers, and the State Highway Engineer, to maintain closer contact with field operating units and personnel through field visits.

[3] In recommendations made previously, the necessity for greater utilization of written media of communication has been implicit. For example, it already has been recommended that basic goals and objectives, operating policies and an organization guide be reduced to writing.

CHAPTER THREE

PERSONNEL MANAGEMENT

The purpose of this chapter is to review the Highway Department's situation with regard to management manpower, and to recommend certain activities designed to alleviate some of the problems which exist. Whether or not the Department achieves its goals and objectives set for accomplishment next year, five years hence, 10 years hence or 20 years hence will, to a very great degree, depend upon the quality of the manpower it has. The latter depends upon how well personnel planning and administration are conducted now.

The Present Personnel Situation

Under existing laws the Highway Commission (and Department) has almost total responsibility and authority for creation, direction and execution of personnel matters in the Department. No laws prescribe the manner in which employees are hired, disciplined or terminated,[1] and the State Personnel Office exercises no direct jurisdiction over these matters in the Department. There is a formally established retirement program which applies to employees of the Department, and which provides for and protects retirement benefits. There is no mandatory retirement age—although maximum benefits may be earned at age 65.

The Department does not operate under a formal civil service, or merit, system. The prevailing philosophy, however, is that employees whose performance is adequate normally can expect to be retained until retirement age.

Several areas of personnel administration were reviewed and analyzed during the study. From these analyses it was determined that there are some existing conditions which require attention—especially in order to avoid personnel problems in the future. These conditions are discussed in the following sections.

The Management Age-Tenure Situation

Of major concern in the Department is the situation regarding age and tenure of managerial and supervisory personnel. A high percentage of personnel in these positions have reached ages and have enough years of service to make them eligible for maximum retirement benefits within the next few years.

An analysis was made of the personnel in managerial and supervisory positions in headquarters units in order to ascertain the age-tenure situation which exists.[2] Forty-one top managerial personnel were included in the analysis, including all the heads of major units. The resulting data are shown in Table I.

TABLE I
AGE AND TENURE OF HEADQUARTERS MANAGERIAL PERSONNEL
November, 1961

Classification	*Number*	*Per Cent of Total*
Retirement age and tenure will be reached within four years	9	22
Retirement age and tenure will be reached within 10 years	17	40
Retirement age and tenure will be reached within 12 years	20	50
Retirement age and tenure will be reached after 12 years	21	50
Total	41*	100*

* Numbers and percentages will not add to totals because they are cumulative.

[1] Other than those laws which apply to retirement.

[2] In both this analysis of headquarters personnel and the analysis of district personnel described later, age 65 was used as the retirement age. There are only two or three cases in which the tenure required for maximum retirement benefits will not be attained by the time this age is reached.

The data included in Table I reveal the following significant facts:

(1) Nine heads of major units, or their assistants, already have reached retirement age, or will within the next four years.

(2) Seventeen heads of major divisions, or their assistants, will reach retirement age within 10 years (including the nine mentioned above).

(3) Twenty heads of major units, or their assistants, will reach retirement age within 12 years (including the 17 previously mentioned).

A similar analysis was made of District, Division and Resident Engineers. The data are shown in Table II.

TABLE II
AGE AND TENURE OF DISTRICT MANAGERIAL PERSONNEL
November, 1961

Classification	*Number Who Will Reach Retirement Age Within* 4 years	6 years	9 years	12 years	*After* 12 years	*Total**	*Average Age*
District Engineers	0	1	4	4	1	5	55
Division Engineers	3	6	11	14	2	16	57
Resident Engineers	2	2	3	3	9	12	50
Total	5	9	18	21	12	33	
Per Cent of Total	15	27	54	63	34	100	

* Numbers and percentages will not add to totals because they are cumulative.

This table reveals the following:

1. All but one of the present District Engineers will reach retirement age within nine years.
2. Eleven of the present Division Engineers will reach retirement age within nine years, and all but two will reach retirement age within 12 years.
3. Of the 12 Resident Engineers, two will reach retirement age within four years and three within nine years. Nine will not reach this age until after 12 years.
4. Fifteen of the 21 District and Division Engineers will reach retirement age within nine years and 18 within 12 years.

An age classification analysis was made of 63 Project Engineers. The data are shown in Table III.

TABLE III
AGE CLASSIFICATION OF PROJECT ENGINEERS
November, 1961

Classification	*Number*	*Per Cent of Total*
59-65 years of age	4	6.0
54-58 years of age	2	3.0
48-53 years of age	8	12.2
42-47 years of age	7	12.0
36-41 years of age	22	33.8
30-35 years of age	20	33.0
Total	63	100.0

These data reveal that approximately 90 per cent of the present Project Engineers are below age 53, and 66 per cent are below age 41.

Education Factors

To gain some idea of the general education level which exists in the Department, an analysis was made of the formal education of employees in selected headquarters and field units. The data gathered during this analysis are shown in Table IV. The analysis included 379 employees in headquarters units

TABLE IV

FORMAL EDUCATION—PERSONNEL IN SELECTED HEADQUARTERS AND FIELD UNITS

December, 1961

	Graduate In Civil Engineering	*Engineering Degree Other Than Civil*	*4 Years College*	*Some College*	*4 Years High School*	*Less Than 4 Years High School*	*Licensed**	*Total*
Headquarters Units								
General Office	3	6	7	19	36	4	8	75
Road Plans	0	1	5	30	28	6	5	70
Bridge	15	2	3	4	5	2	7	31
Interstate and Traffic	8	4	2	6	7	0	6	27
Materials	0	6	2	15	29	13	3	65
Right of Way	0	0	2	11	14	1	1	28
G.V.W.	0	0	0	6	6	4		16
Data Processing	1	0	2	4	10	0	1	17
Personnel—Office Services	0	0	0	0	5	0		5
Construction	0	0	1	4	2		1	7
Equipment	0	0	0	3	3	3		9
Processing	0	0	0	2	4	1		7
Office Engineer	1	0	0	3	4	1	2	9
Maintenance and Communications	0	1	1	4	7	0	7	13
Total	28	20	25	111	160	35	41	379
Field Units								
District Engineers	1	1	0	0	3	0	5	5
Division Engineers	0	1	1	4	8	3	12	17
Resident Engineers	0	2	0	4	4	0	9	10
Project Engineers	2	3	1	20	31	5	9	62
Total	3	7	2	28	46	8	35	94

* Not included in Total column.

and 94 field personnel in the categories indicated in Table IV.

Some of the significant factors derived from Table IV are:

1. In the headquarters and field units analyzed, there are 31 persons who hold degrees in civil engineering. Fifteen of these are in the Bridge Department at headquarters.
2. There are 27 persons who hold degrees other than in civil engineering. Several of these degrees are in scientific fields applicable to specialized areas in which some of these employees work.
3. Among the 94 present District, Division, Resident and Project Engineers, there are three who hold degrees in civil engineering and seven who hold degrees in other engineering fields.
4. Thirty-four persons in headquarters units are licensed as professional engineers, and seven in specialized areas (FCC). Thirty-five of the 94 persons included in the field unit survey are licensed as professional engineers.

Managerial and Supervisory Potential

In addition to analyzing the age-tenure and education situation, it was deemed desirable to conduct a rather detailed inventory of managerial and supervisory personnel in the Department. The basic purpose of this inventory was to ascertain the apparent reservoir of presently competent, or potential, management and supervisory personnel with whom to replace higher-level managers when they leave the Department for reasons of health, resignation or retirement.

The manpower inventory included an evaluation of the potential for advancement of all present managerial and supervisory personnel in the Department. The evaluations were confidential and were made by supervisors of individuals included in the analysis. Factors evaluated were:

1. The desire of the person to advance to a position of greater responsibility, as indicated by the person himself.
2. Belief of the person as to his ability to advance further, and to what position, as indicated by the person himself.
3. Desire and ability of persons to advance further, as indicated by their supervisors.
4. Qualification of individuals for advancement.

In analyzing the data gathered, four classifications were established to indicate ability and potential for development. These were: (1) good—potential for advancement good; (2) possible—potential for advancement possible; (3) doubtful—potential for advancement doubtful, and (4) none—no potential for advancement because of age or ability, or both.

TABLE V
MANPOWER INVENTORY
MANAGERIAL AND SUPERVISORY POTENTIAL
1961

	*Potential for Advancement**				
	Good	*Possible*	*Doubtful*	*None*	*Total*
Headquarters Units					
Professional Classification	41	26	9	15	91
Sub-professional Classification	21	39	27	31	118
Non-engineering Classification	34	47	42	39	162
Total	96	112	78	85	371
Field Units					
District and Division Engineers	3	7	3	8	21
Resident Engineers	2	4	3	2	11
Project Engineers	13	29	9	13	64
Other Construction Personnel	9	10	4	0	23
Other Maintenance Personnel	1	14	5	25	45
Total	28	54	24	48	164

* Potential for advancement is determined by present age as well as by ability. Therefore, able persons in the higher age bracket are classified under "None."

Partial results of the manpower inventory are summarized in Table V, which reveals the following significant factors:

1. Headquarters Units
   (a) Professional Classification—Evaluations indicate that 41, or 45 per cent, of the present personnel possess "good" potential to advance to more responsible positions; 26, or 28 per cent, have "possible" potential; and 24, or 27 per cent, possess "doubtful" or "no" potential to advance.
   (b) Sub-professional Classification—Evaluations indicate that only 21, or 17 per cent, possess "good" potential for advancement to more responsible positions; 39, or 33 per cent, have "possible" potential; and 58, or 50 per cent, have "doubtful" or "no" potential for advancement.
   (c) Non-engineering Classification—Evaluations indicate that 34, or 21 per cent, have "good" potential; 47, or 29 per cent, possess "possible" potential; and 81, or 50 per cent, have "doubtful" or "no" potential to advance.
2. Field Units
   (a) District and Division Engineers—Evaluations indicate that only 3, or 14 per cent, have "good" potential for advancement to more responsible positions; 7, or 33 per cent, possess "possible" potential; and 11, or 51 per cent, have "doubtful" or "no" potential.
   (b) Resident Engineers—According to the evaluations only 2, or 20 per cent, have "good" potential for advancement; 4, or 40 per cent, have "possible" potential; and 5, or 50 per cent, possess "doubtful" or "no" potential for further advancement.
   (c) Project Engineers—Evaluations indicate that only 13, or 20 per cent, have "good" potential for advancement; 29, or 42 per cent, have "possible" potential; and 22, or 38 per cent, possess "doubtful" or "no" potential for advancement.
   (d) Other Construction Personnel—This includes Office Engineers, Soils Engineers and Designers. Evaluations indicate that 9, or 40 per cent, have "good" potential for advancement to more responsible positions; 10, or 42 per cent, have "possible" potential; and 4, or 18 per cent, have "doubtful" potential.
   (e) Other Maintenance Personnel—This includes Maintenance Foremen, Division Mechanics and Office Managers. Only 1 was considered to possess "good" potential for advancement; 14, or 30 per cent, were felt to have "possible" potential; and 30, or 70 per cent, were felt to possess "doubtful" or "no" potential for advancement.

Management Planning and Development

The preceding analyses, when correlated, reveal a major area for concern in the Department—*the pressing need for management and supervisory manpower planning and development.* The major facets of the problem, as revealed by the foregoing analyses, are:

1. A high percentage (43 per cent) of the managerial personnel of the Department — from the State Highway Engineer through headquarters unit heads and District and Division Engineers —will reach retirement age and tenure within the next nine years, and 51 percent will reach this status within 12 years. This analysis is based on age alone, and does not consider manpower losses which may occur due to death, sickness, resignation or for other reasons.
2. In many instances the logical successors to major managerial personnel—assistant department heads and division and resident engineers—are almost as old as, or older than, their superiors. In such cases the logical "line of succession" is broken.
3. A relatively small number of personnel are evaluated by their superiors as possessing the necessary ability to advance to higher positions, or the potential to develop into higher-level managers. This is particularly true in the maintenance function, but is generally true in all professional classifications. It should be noted, in particular, that relatively few Resident or Project Engineers have been evaluated as having "good" potential for advancement.
4. In many instances individuals who have been evaluated as possessing "good" potential to advance to higher positions are now in lower professional classifications and will need considerably more experience and development before becoming ready to succeed to higher-level positions which probably will become vacant within the next decade.
5. There is a relatively small percentage of engineering graduates in the Department as a whole. By way of comparison, Montana ranked fourth from the bottom among highway departments

in all states and the District of Columbia in the percentage of graduate civil engineers among total classified engineers employed in 1960. The percentage of graduate civil engineers employed in this category by Montana was 14.2 per cent—*compared to the national average of 44.5 per cent!* [3]

The situation described above indicates that the Highway Department should take immediate action to analyze, define and fulfill its managerial and supervisory personnel needs. Unless a well-planned and directed program of manpower planning, development and recruitment is undertaken, the Department will be unable to accomplish properly the management improvement activities recommended in this report—and will be totally unprepared to meet the increasing requirements for managerial and supervisory personnel a few years hence.

In the following sections, a series of recommendations relating to this important aspect of personnel administration are made and discussed.

RECOMMENDATION NO. 1

Maintain a continuous analysis of the Department's managerial and supervisory personnel needs—and of personnel available to fulfill these needs.

This is the initial step in a program of manpower planning and development that should be undertaken in the Department. A manpower inventory such as the one initiated as a part of this study is the basic requirement for implementing this recommendation. Such an inventory, if maintained on a continuous and up-to-date basis, provides the following:

1. An analysis of both short- and long-range managerial and supervisory personnel needs, and a basis for planned replacement when vacancies occur.
2. An inventory of specific individuals who presently are capable and worthy of promotion to higher positions, as well as of those who possess potential ability to advance in the future.
3. A sound basis for planning and conducting personnel training and development activities in the Department.
4. A sound basis for developing a planned and systematic personnel recruiting program.

With further refinement and analysis, the manpower inventory already initiated will be an invaluable aid in making the organizational changes recommended in this report. It will define:

1. The specific personnel presently in the organization who should be assigned to each managerial and supervisory position in the recommended organization.
2. The positions for which there are no personnel presently qualified—and for which individuals may have to be recruited from outside the Department.
3. Positions which, though filled now, may be vacated in a relatively short period of time, and the identification of personnel whom the Department should start training and developing now to fill such positions. If analysis reveals that there is not a sufficient quantity of potentials to provide replacements in such instances, steps should be taken to recruit persons with the abilities needed.
4. A forecast of the effect of promotions and other organizational changes on personnel needs of the Department over the next few years, and the development of a recruiting plan to fulfill these needs—in terms of the specific number and qualifications of persons needed.

The steps described above will assure adequate consideration to personnel aspects associated with the changes in the organization structure recommended in this report. It is emphasized that these should be the first steps taken in effecting these changes.

RECOMMENDATION NO. 2

Plan and conduct a systematic recruiting program.

The analyses of the ages, education and potential of managerial personnel all point toward a need for the Department to intensify its recruiting activities. Half the present headquarters unit managers, their assistants and District and Division Engineers can be expected to be lost to the Department within

[3] Highway Research Board, Bulletin 296, *Highway Employment Trends and Requirements*, p. 26, 1961.

the next decade. Furthermore, the analyses indicate that there is a shortage of personnel capable of advancing to these positions—due either to lack of sufficient experience or ability, or both. The time to take action to avoid a critical situation several years hence is *now*.

In planning and conducting a systematic recruitment program, the Department should concentrate its attention in areas discussed in the following paragraphs.

The Department should recruit personnel to assure that present needs of the organization—occasioned by the structural changes recommended—are satisfied. It may be necessary to recruit personnel outside Montana to fulfill these needs. It is recognized that the practice of promoting from within the Department is a good policy. However, in the event that analysis and evaluation reveal there are no personnel capable of filling positions of greater responsibilities, or which require special skills, the Department should not hesitate to recruit them from outside. *It is good business to do so.*[4]

The Department also should plan a recruitment program designed to attract more graduate engineers.[5] In so recommending, it is recognized that a considerable number of present engineering employees have fulfilled the requirements for the professional engineer's license, and that a very effective engineering training program has been conducted for several years. It also is recognized that a degree in engineering does not necessarily insure better performance on the part of the person who has the degree in comparison to someone who does not.

However, it is emphasized that the requirements of highway work are becoming more technical and complex and that changes in techniques, materials and equipment occur constantly. Personnel in engineering functions must keep abreast of such changes. In order to do so, they must possess a solid background and foundation in the fundamental theories, concepts and principles of engineering. These can best be obtained by formal engineering training at an accredited institution.

A variety of recruiting methods may be used by the Department in stepping up its recruiting efforts. One effective method is to place advertisements in newspapers in geographical areas where statistics indicate there is a surplus of personnel with the basic educational and skill requirements needed by the Department. Inquiries in response to such advertisements, of course, must be followed up and adequate selection techniques must be followed. It is quite likely that experienced personnel, who have the skills and abilities needed by the Department, would be willing to change in response to challenge and opportunity.

Advertisements in technical journals and periodicals are another source of personnel contacts.

Recruiting is essentially a selling task. Representatives of the Department who are assigned recruiting duties should emphasize the positive attributes of the Department which are calculated to attract prospective employees. The Department has several outstanding assets that should enable it to attract its share of qualified employees. Examples are:

1. The salary schedule recommended in this report certainly will place the Department in a competitive position.
2. The organization is growing and there should be sufficient opportunity for challenging work and professional advancement.
3. The climate, terrain and recreational features of Montana will appeal to many individuals.

It is emphasized that the refinement of the manpower inventory in order to derive the personnel information necessary to proceed with organizational changes and personnel needs *can be accomplished now*. There are other phases of personnel management to which more attention should be directed in the future. These are discussed below.

The Personnel Branch

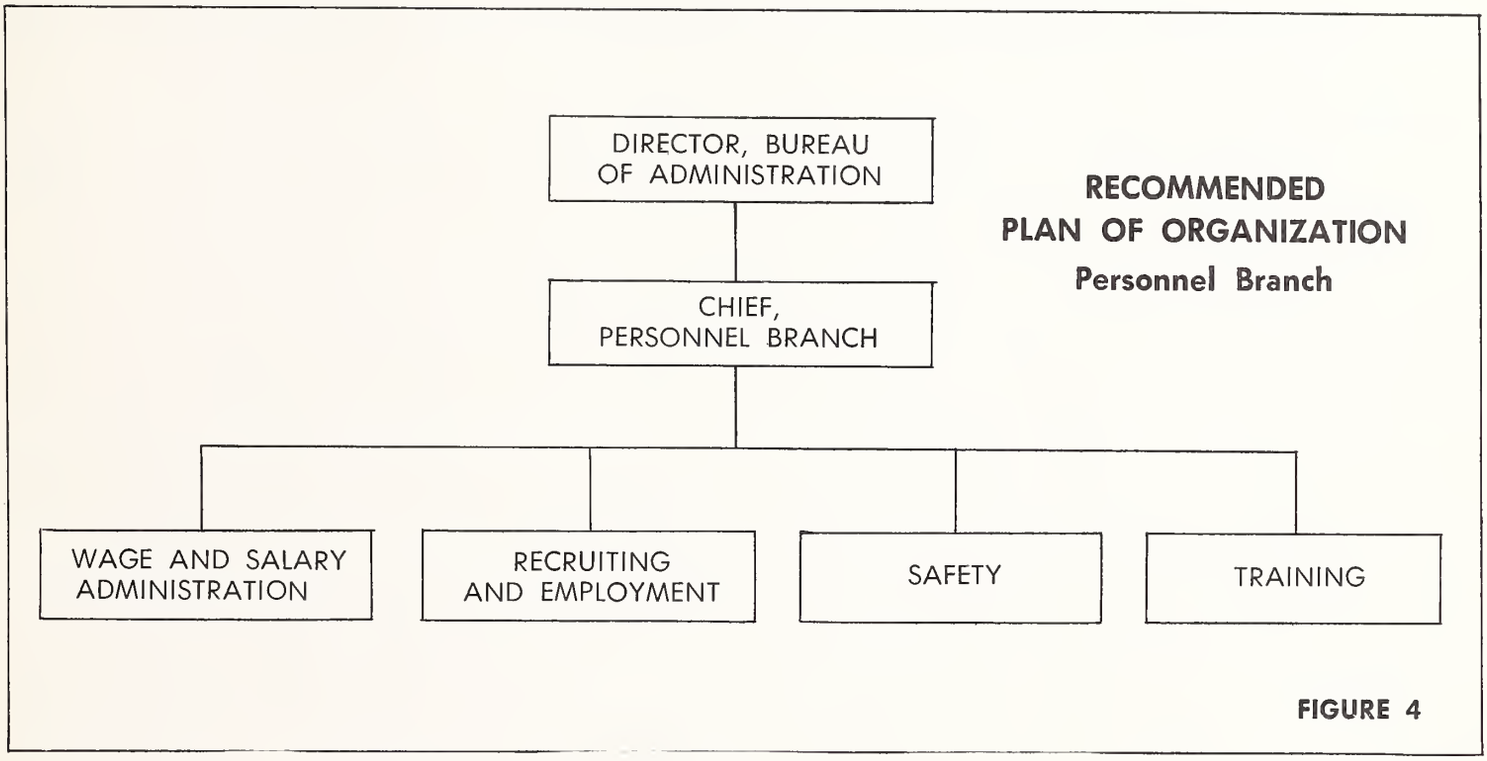
No other area of management affects the over-all operations of an organization more than its personnel policies and practices. In order to assure proper attention to the manpower planning and development activities described above—and to other important phases of personnel management—the Department should take immediate steps to increase the scope and functions of the Personnel Branch.

In Figure 4, the recommended functions of the Personnel Branch are depicted. It is emphasized

[4] An effort should be made—when bringing new personnel into the Department—to bring them in at middle management or lower-level positions in anticipation that they will be trained for higher-level positions. This practice may not always be possible.

[5] It has been pointed out previously that the Department ranks very low among all highway departments in the number and percentage of graduate civil engineers employed. See footnote [3] of this chapter.

that the delineation of the functions does not necessarily mean that an individual must be employed for each—one person may be responsible for more than one function. However, in the future, it probably will be necessary and desirable to employ persons with special skills and training to handle some of the personnel functions.



RECOMMENDED PLAN OF ORGANIZATION
Personnel Branch

FIGURE 4

The functions of the Personnel Branch, as depicted in Figure 4, will directly support and facilitate the basic function of manpower planning, development and administration. This branch should be responsible for performing a major part of the research, data-gathering and analysis of data related to all personnel matters in the Department—*and should provide staff guidance, assistance and direction in these areas.*

There are two areas—in addition to the manpower inventory and analysis and the development of a recruitment plan described previously—to which this branch should devote special attention in the future. These areas are indicated in the recommendations which follow.

RECOMMENDATION NO. 3

Develop a performance appraisal system designed to improve managerial and supervisory performance.

At the present time two performance appraisal forms—one for supervisory personnel and one for non-supervisory personnel—are used in the Department, primarily in direct relation to salary adjustments. Experience has shown that when performance ratings are directly related to salary adjustments they generally are ineffective—either as indicators of true performance or as aids for improving performance—for the following reasons:

1. Both superior and subordinate tend to ignore performance improvement values, and concentrate attention upon salary or wage adjustment.
2. Superiors tend to rate all subordinates the same. Thus, the distinctions necessary to provide merit increases are lacking.
3. Performance ratings among units and districts are not consistent nor comparable.

The Department should develop an appraisal system which has for its major objective the improvement of performance—and the appraisals should not be related, as such, to salary increases. The essential elements of the system should be as follows:

1. The form should provide the following—
   (a) The elements of the job of the person being rated, and performance standards for each element.

(b) A graded rating in such terms as "below standard," "standard," "well above standard" —rated in terms of the performance elements of the position.

(c) A rating of personal characteristics and traits of the person as to the degree these are assets or liabilities to his qualifications.

(d) A written description of the strong points of the subordinate's performance, areas where performance can be improved and recommended action by the subordinate and his supervisor.

(e) An indication of any particular positions for which the subordinate has become qualified, as appropriate.

2. It should require that the superior and the subordinate meet at periodic intervals (at least once each year) to discuss an appraisal of the latter's performance, his strong and weak points and areas in which his performance should be improved—all in an objective manner.
3. It should encourage the development of a specific program of action—arrived at jointly by the superior and subordinate—to be undertaken by the subordinate to improve his performance.
4. It should require all supervisors to view development of subordinates as a major responsibility of their job. Their activities in this respect should be a factor upon which their performance is evaluated.
5. It should require that appraisal forms be maintained as a continuous record of the past experience and performance of the subordinate, his record of promotions and the actions taken by him to better qualify himself and improve his performance.

The effectiveness of the appraisal system is directly dependent upon the implementation of the previous recommendations to clearly define functions and jobs in the Department. Each employee needs to know what his job is, how well he is expected to perform the job and how well he actually is performing—before he can improve his performance. It also is pointed out here that the records of the performance appraisals will provide the basic source of information to maintain the manpower inventory on a continuous basis.

RECOMMENDATION NO. 4

The Personnel Branch should constantly analyze training needs of the Department and provide staff guidance and leadership in satisfying these needs.

The Department has done an outstanding job of providing engineering and technical training—and, to some extent, managerial and supervisory training—in the past. However, training is a major requirement in any organization if manpower planning and development is to be practiced successfully. It is recommended, therefore, that a major function of the Personnel Branch be that of constant analysis of training needs of the Department and the provision of staff guidance, assistance and leadership in these activities.

Particular emphasis should be given to training in management and supervisory skills and techniques, as well as in technical and operating aspects. In conducting training, of course, the Department should rely on its own personnel—managers, supervisors and persons with special skills—to the degree practicable and feasible. However, it also should seek assistance from educational institutions or other sources, where necessary.

The functions of the Personnel Branch in the area of wage and salary administration will be discussed at greater length in Chapter Five.

CHAPTER FOUR

PLANNING AND CONTROL

In preceding chapters emphasis has been placed on the need for setting objectives and for effective organizing and planning by top management. The first requirements for accomplishment in these areas are to establish a proper Commission philosophy, to codify policies and procedures, to develop an efficient organization structure and to take a broad approach to management manpower planning. All these aspects have been dealt with in earlier sections of this report.

It must be recognized, however, that in the performance of these management functions, top management itself needs help in the way of factual guides and measures for scheduling and control. This is the fundamental purpose of the recommended Bureau of Planning and Administrative Research.

With a separate organizational unit charged with the specific responsibility of planning and administrative research, the Commission and the Department can establish a firm and comprehensive foundation for over-all operation as well as for individual phases of the highway program. The following are brief examples of areas in which this new bureau could be particularly valuable:

1. Priorities and Scheduling—Setting construction project priorities and establishing a specific and firm schedule of improvements for several years in advance require the formulation by the Department of a long-range program—a plan that represents a realistic appraisal of current needs and a forecast of future developments and finances. It must be kept up to date.
2. Standards and Control—In setting standards and controlling the operation and maintenance of the highway system, there is need for measures of performance and for more effective scheduling and controlling of the repetitive activities of the Department. Top management should have factual summaries and analyses on which to base these.
3. Additions to System—In determining what additions properly may be made to the State's obligation for highway system maintenance, the Commission needs a sound procedure for evaluating future financial requirements for reconstruction and maintenance.
4. Accident Analyses—In meeting the Department's obligation to provide the ultimate in safety for the highway users, there is need for a broader approach to accident analyses and to the placing of priorities on the correction of the most hazardous highway situations.

All of these areas of needed emphasis and additional activity are associated with fact gathering, data analysis and forecasting. They provide the basic tools for the planning and controlling of the Department's operations. They are essential if top management is to perform effectively. They hold great promise for marked improvement in highway management.

To some degree these activities must be associated with the operational and functional units of the Department—maintenance, traffic, construction, bridge, etc. *Primarily, however, there is required a greater emphasis on planning and administrative research, independent of the functional units themselves.* There is a need for analysis and review and for correlation of data that goes beyond a single functional unit. Furthermore, this type of research and analysis requires assignment of personnel specially qualified and interested in research and unencumbered by day-to-day operating problems.

For these reasons, the following recommendation is made:

RECOMMENDATION NO. 1

Establish a Bureau of Planning and Administrative Research to meet the need for development of long-range programs, priority schedules, performance standards, control measures and other administrative research.

As an indication of the character, scope and importance of the proposed bureau's activities, there are hereafter described and recommended specific projects contemplated in several areas of activity.

RECOMMENDATION NO. 2

The Bureau of Planning and Administrative Research should initiate a maintenance function research project.

The questions associated with maintenance in all public highway agencies are pretty much the same:

How to organize an efficient operation within the limitations imposed by its being a non-competitive, non-profit government activity?

How to plan, schedule and supervise work over a huge area?

How to provide adequately for emergency conditions?

How to provide for the seasonal character of important work elements?

How to evaluate the potentialities of new equipment and methods?

How to evaluate alternative procedures for doing work?

How to provide the optimum in service to the highway users within reasonable economic limits of cost?

How to establish performance standards for recurring work items?

How to establish basic manpower and equipment requirements?

How to maintain uniformity in quality of work?

How to measure and control maintenance performance?

How to recruit and develop field personnel?

How to appraise the potentialities for utilization of competitive bidding by contractors for certain work items?

How to determine the economy of rental agreements versus state ownership for special equipment or for trucks during peak period requirements?

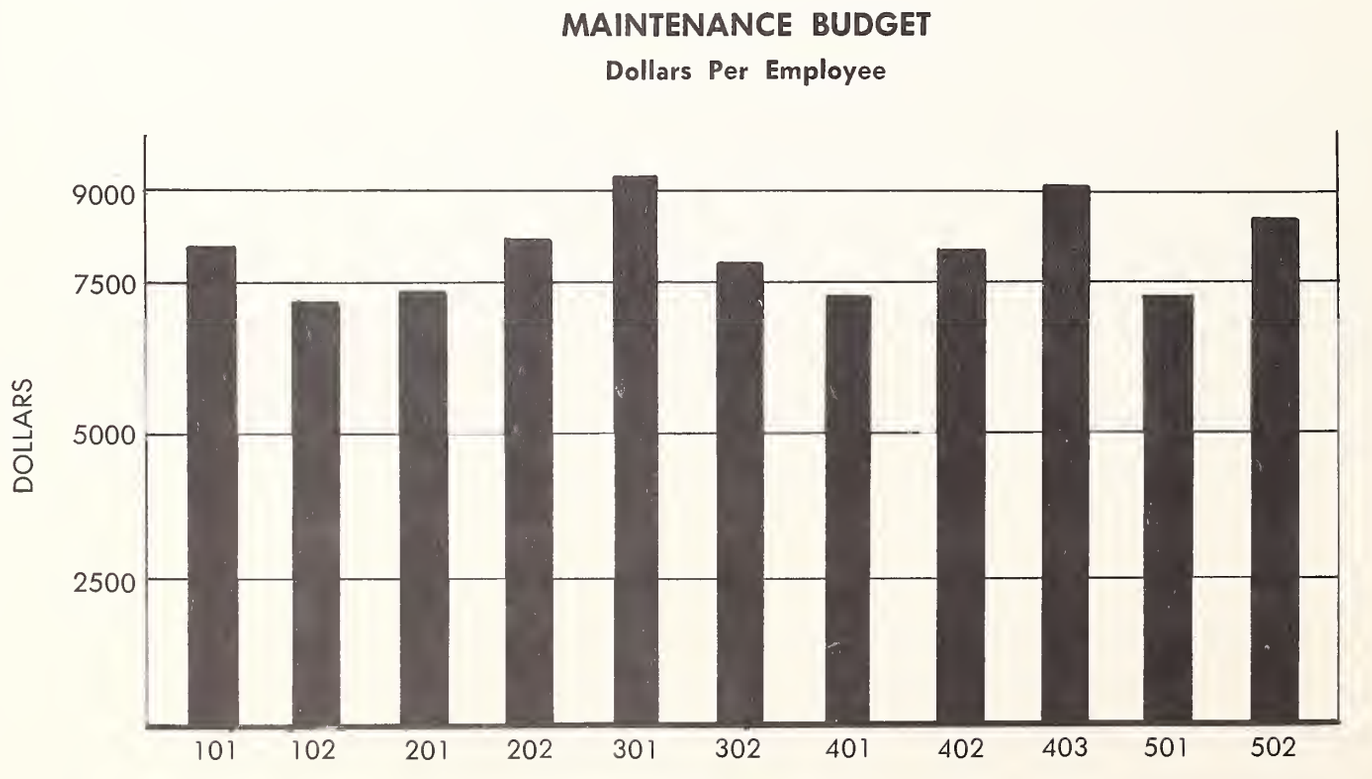


FIGURE 5

Answering such questions as these are important decisions to be made by top management. The Chief, Maintenance Branch of the Bureau of Operations, in the organization plan recommended in Chapter Two, would have these as his primary areas of activity. In some instances, he would be expected to make recommendations through the Director of Operations and the State Highway Engineer to the Commission, so the Commission could properly set the over-all policies and objectives of the maintenance program. In other cases, the Chief of the Maintenance Branch would be expected to develop, subject to approval of the Director of Operations and the State Highway Engineer, the standards and control procedures to be imposed on the field maintenance operations.

However, while the Chief, Maintenance Branch would have staff responsibility for providing answers to the foregoing questions, he should have the benefit of studies by the Bureau of Planning and Administrative Research on which to develop his recommendations. Indicative of the character of research contemplated are some illustrations of the kinds and significance of material already available for analysis.

Because the maintenance budget and personnel reports currently are made by divisions, it is possible to make some helpful comparisons from available data.[1] In presenting these data it is recognized that this represents only the beginning of analysis in any of these areas. But the data illustrate some of the relationships and evaluations that are involved in answering the many questions associated with the planning of the maintenance function.

Figure 5 provides a comparison between divisions in the amount budgeted per maintenance employee. The budget, of course, includes materials, supplies and equipment. That there is considerable variation between divisions is reflected in Figure 5—and also by other data available in the records. The comparison, in itself, gives no answers, but it does illustrate the need for data to establish why variations exist and the degree to which they should exist.

[1] Because these figures and comparisons are related to existing divisions, the discussion of them also must be in terms of divisions, even though it is recommended that this operating designation no longer be used.

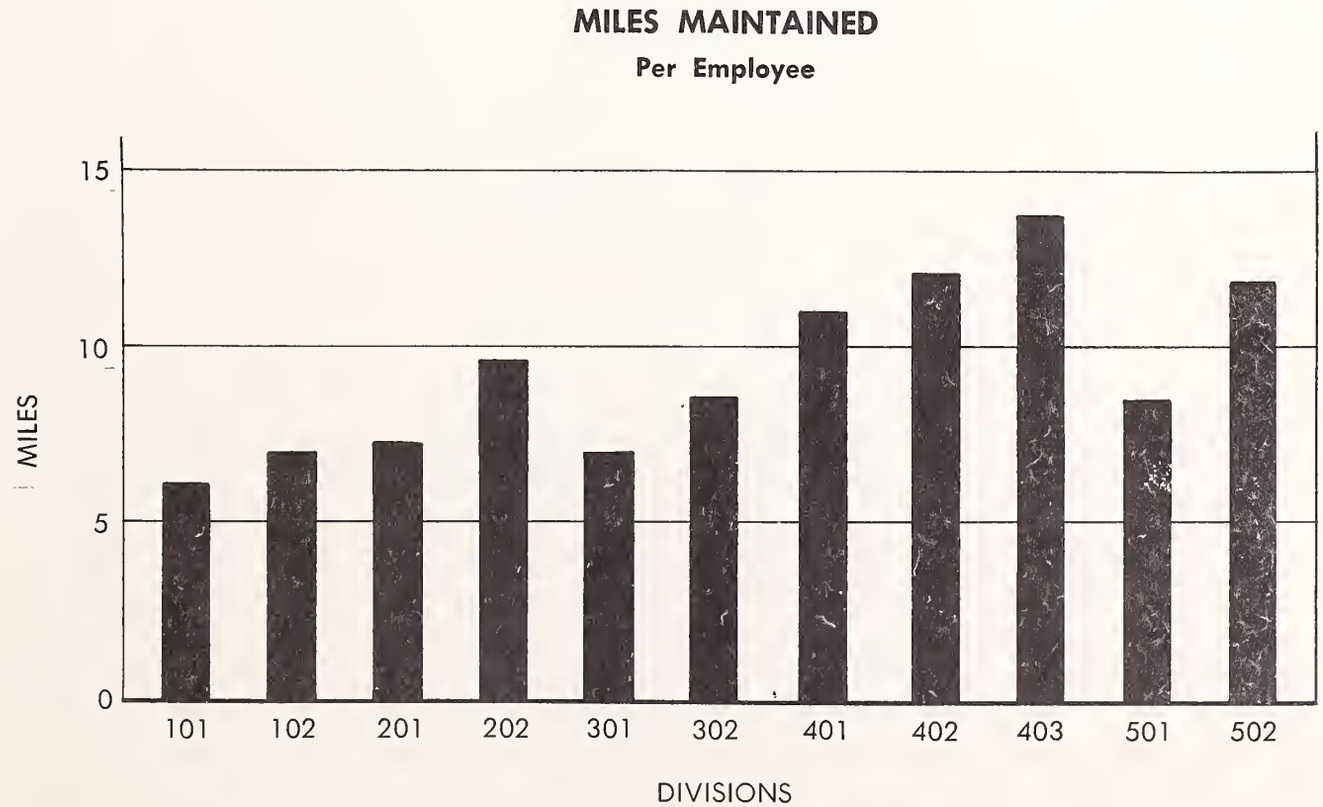
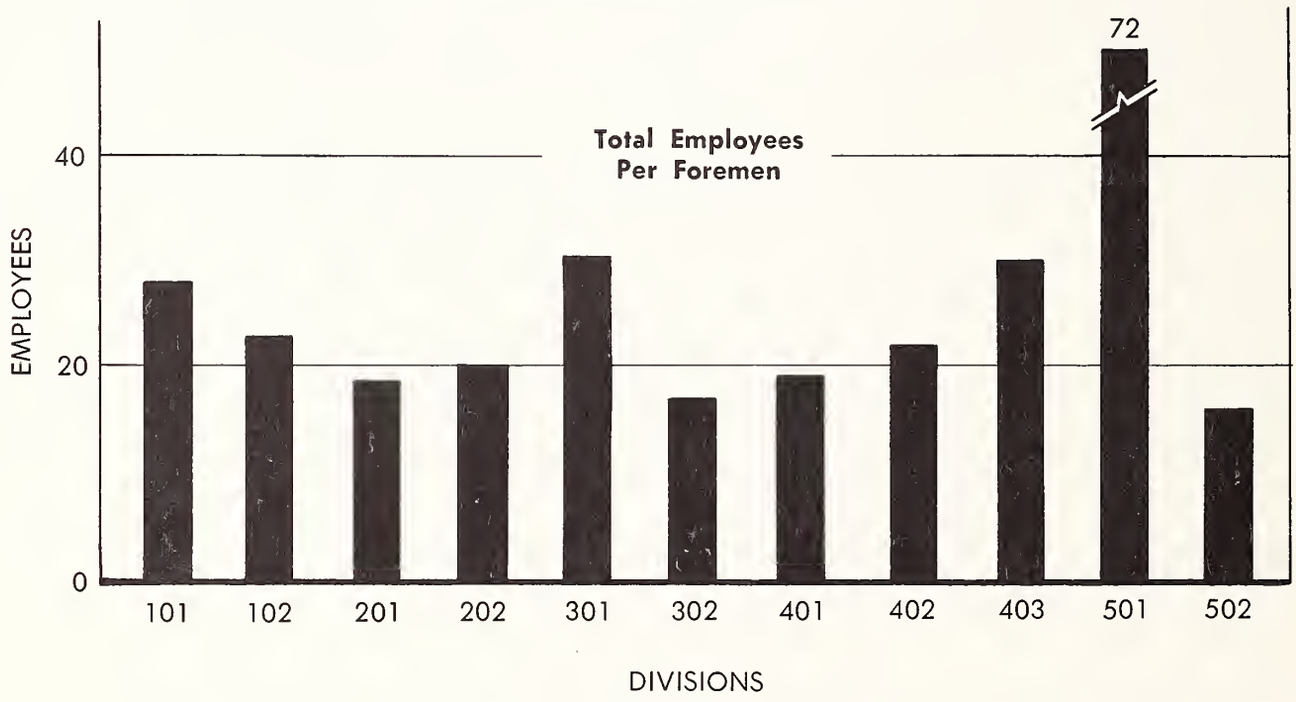


FIGURE 6

RATIO

FIELD SUPERVISORS TO TOTAL

MAINTENANCE PERSONNEL



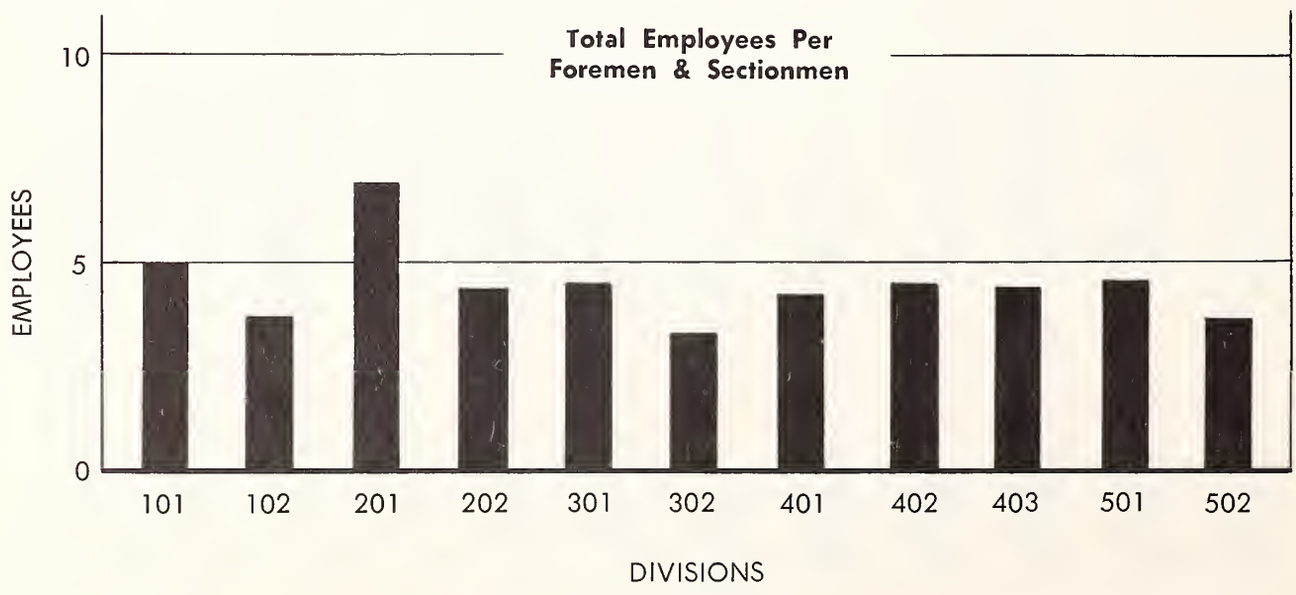


Figure 7

Figure 6 shows the miles of highway maintained per maintenance employee in each division. Here again, Figure 6 provides no answer as to what management should prescribe as the standard for assignment of personnel quotas. It does illustrate the problem—and with supplementary data it should be possible to establish manpower quotas realistically related to the varying conditions between divisions, yet consistently applied from division to division.

Figure 7 shows the ratio of maintenance field supervisory personnel to total maintenance employees in each division. The upper chart in Figure 7 makes the comparison based on men with "foreman" classification only. The lower chart also includes men classified as "sectionman." With adequate study and depending on the degree to which "gang" crews are organized in contrast with "patrolmen" or "sectionmen," a desirable ratio pattern can be established toward which the total organization should be directed.

While not depicted in chart form, the review of maintenance equipment discloses rather striking variations in the types and quantities of equipment presently in use in the divisions. Except as local conditions may require special equipment, there are reasons of economy for working toward uniformity in types of equipment and in the quotas allotted. The maintenance function research project will provide guidance for this.

It has been said in regard to the highway maintenance activity nationally that it provides greater potential for dollar savings from management improvement than does any other activity of highway departments.

If the Montana Highway Commission initiates the type of maintenance function research here recommended, it will be one of the early pioneers in the effort to make maintenance planning and control a scientific management operation.

A suggested outline for a maintenance function research project is presented in Chapter Six, in which a program for action is discussed.

RECOMMENDATION NO. 3

The Bureau of Planning and Administrative Research should initiate a continuing highway needs appraisal.

This project should be directed toward providing top management the basis on which answers can be given to such questions as:

What is the minimum adequacy service level (how good a road) that should be considered acceptable at different traffic volumes and in each character of terrain?

How much of the several highway systems—Federal-aid Primary, Secondary and Urban—currently are deficient, and what are the cost estimates for improvement?

What is the rate at which segments of the highway systems are depreciating because of structural deterioration or traffic increases?

To what degree are foreseeable funds adequate to finance needed improvements and to continue necessary maintenance?

Is the Highway Commission adequately financed to take over secondary roads? How many? When? Which roads are most important to statewide interests?

What are the priorities for improvement of deficient highway sections?

This continuing needs inventory research project can be accomplished with an expansion of the work now being done in the Highway Planning Survey, which unit—it is contemplated—would become a key segment of the new Bureau of Planning and Administrative Research.

Illustrative, in part, of the nature of this research activity is Figure 8, which presents the historic trend of deficient mileage as determined by the annual calculations on which the allocation of funds is made between Financial Districts.

It appears that the deficient mileage evaluations have served an effective purpose in providing a basis for apportioning funds to assure reasonably uniform development of the highways throughout the State. It also appears that considerable progress has been made in overcoming deficiencies.

However, recent developments in appraising road service adequacy and in projecting future needs provide a basis for the long-term needs forecasting that is so important to the Commission in setting over-all objectives and in establishing construction project schedules with firmness and with adequate

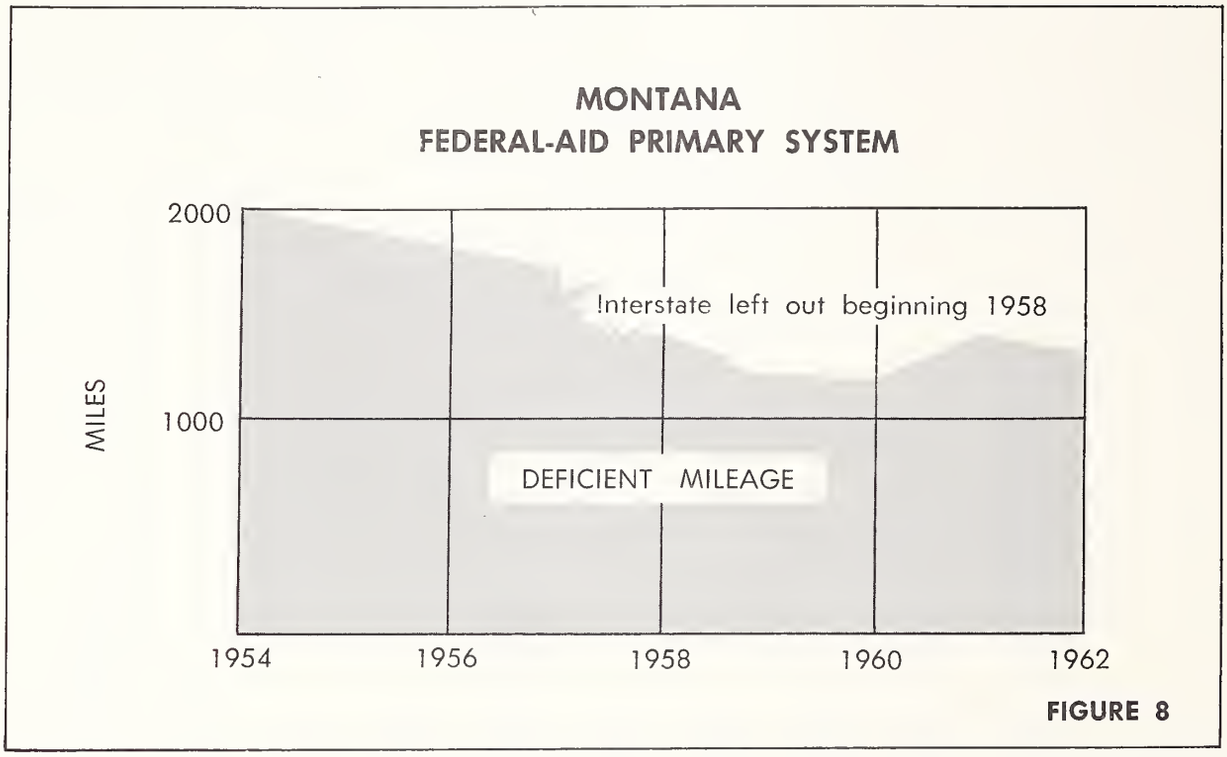


FIGURE 8

lead time. The new developments are based on providing continuing appraisals so current data always are available. Procedures are described in a paper by the Consultant prepared for the Highway Research Board and appearing in the 1961 *Proceedings*, pages 35 to 44.

Adoption of similar procedures by the Montana Highway Department will provide the basis for answering the several questions posed above with regard to highway deficiencies, priorities and so on.

For example, in connection with the Federal-aid Secondary System it is understood that the system totals about 5230 miles, of which the Commission took over for maintenance 271 miles on October 3, 1961. It also is understood a commitment has been made to take over additional mileage as it is improved. Obviously, the Commission's position in dealing with such matters would be enhanced if it had a good projection of financial requirements to maintain and improve the *existing* State-maintained mileage. As this planning research activity advances the Commission would have a firm basis for knowing if projected funds will permit taking over additional mileage for State maintenance—and when such mileage, if any, might properly be taken over without handicapping the fulfillment of other Commission obligations.

As a further indication of the value of continuing appraisals of highway needs, they will furnish a basis for recommending to the Commission—and for adoption by the Commission—of a specific schedule of projects for improvement with priority based on the need for improvement.

The Commission and the Department now have a two-year project listing for scheduling, planning, design, right of way acquisition and other preliminaries to construction. This has been helpful to scheduling engineering and right of way work. The Department also is making continually more effective use of the program scheduling board and the controls associated with it. There is an obvious need, however, to get more lead time and to get projects scheduled with careful evaluation of priority of need and with due regard to their relation with other elements of the program.

It is quite apparent that once an effective continuing needs appraisal is established it will be possible to set up project schedules over three, four or five years—as may prove desirable—with confidence in the selection and with ample time for deliberate planning, design and right of way negotiation.

RECOMMENDATION NO. 4

The Bureau of Planning and Administrative Research should initiate an analysis of accident records to provide measures of the safety associated with highway modernization and to guide improvement scheduling in the interest of safety.

Based on considerable factual data, much emphasis is given to the safety values associated with the development of the Interstate System. It is important to recognize, however, that this is only a

limited part of the total highway system and that the potential for added safety exists in varying degrees on all highways.

The research activity here recommended can provide the Commission and top management of the Department with quantitative measures and guides for all highway improvement—not on just the Interstate System—in the interest of safety that will give more satisfaction to the public and—in fact—provide a greater public service than can any other single activity in the Department.

This is a broad, bold statement—but we have data currently being developed in three other states, where we are currently working as planning consultants, that are so consistent and so striking as to justify the above statement.

The details of the suggested analysis will not be presented here because they are somewhat involved and technical. However, the basis on which accident records are maintained for the Montana Highway System can be adapted to the suggested analysis.

The results from the analysis would take form as follows:

First, there would be an evaluation of the combined accident rate on all critically deficient road sections and a comparable rate for all high-standard road sections. This is done by traffic volume groups of roads to assure comparability between the poor and the good roads. This evaluation will provide a measure of the safety value associated with the improvement program. It will be possible to express quantitatively the potential reductions in accidents, the saved lives, injuries prevented and property damage avoided. It will be factual. It will be convincing and, from indications in other states, the safety values will be of an appreciable magnitude.

Second, there would be established a continuous evaluation of accidents by road sections, adding each succeeding year's data to previous accumulations of accidents so long as the road section remains basically unchanged in physical character or traffic volume served. This analysis, initially, will be significant only on heavier traveled and higher accident routes. However, even in the beginning, it will give a guide for project scheduling that will assure a maximum return in highway safety. Furthermore, as additional records are accumulated in the years ahead, the analysis will assume ever increasing applicability.

Summarizing the two foregoing paragraphs:

1. The first evaluation will show the safety value of the over-all program of highway modernization.
2. The second evaluation will provide a guide for giving priority to particular improvements because of the great potential for accident savings.

Illustrative of what this might provide are these general figures from another state:

1. The average accident rate on critically deficient road sections (sufficiency ratings below 60) is 2.10 accidents per million vehicle miles.
2. The average accident rate on road sections considered adequate (sufficiency ratings above 80) is 1.45.

These figures indicate a potential for accident reduction of 30 per cent as critically deficient road sections are improved.

A research study of this kind by the Montana Highway Department will provide the very best type of public information data on which to present to the people the significance of the highway modernization program. Everyone—legislator, highway user, parent and youngster—is continually made aware of the hazards associated with highway travel and the need to do everything possible to minimize them. The highway modernization program is an important element in providing greater safety. We need badly to have factual measures for expressing it.

RECOMMENDATION NO. 5

The Bureau of Planning and Administrative Research should undertake projects to provide guidance to top management in establishing over-all policies, defining key position descriptions and carrying forward a management manpower development program.

All of these activities have been discussed and recommendations made thereon in preceding chapters of this report. It is important to recognize, however, that the accomplishment of the objectives in an effective manner requires study and research to provide a firm foundation on which these things can be soundly based.

The Bureau of Planning and Administrative Research should be organized with the kind of personnel who can undertake this type of research as well as the more traditional planning research activities heretofore generally associated with highway planning. In setting up specific projects—whether they be for policy review and analysis, or position descriptions, or management manpower development—it is suggested that guidance committees be created for each research project. In some instances, all Bureau Directors might be appropriate as the guidance committee. In other cases, the Director of Administration, the Chief of the Personnel Branch, and one or two representatives from other bureaus would be logical committee members.

Because this type of research project represents something fundamental to any positive advances in top management, organizing it should be undertaken with great vigor and with promptness.

In Chapter Six, there is presented an outline for an appropriate series of research projects in this area.

CHAPTER FIVE

WAGE AND SALARY ADMINISTRATION

Effective wage and salary administration should provide the cornerstone of the personnel program in the Montana Highway Department. A systematic and equitable plan of compensation is a fundamental element of wage and salary administration.

The purpose of this chapter is to present the wage and salary plan developed as a major part of the study. The plan developed by the Consultants embodies certain widely-recognized principles of wage and salary administration. These are set out below:

1. The same range of pay, or salary level, should apply to all positions in a single class of work regardless of the organizational unit in which such positions are located.
2. There should be equal pay for the same type and quality of work under similar working conditions.
3. The pay rates provided should be comparable to those prevailing in private and other public employment in the area.
4. Provision should be made for adjustment of individual salary rates within the ranges in recognition of increased efficiency and quality of work and experience gained on the job.
5. The pay plan must be adjustable to meet changing employment and economic conditions.

Salary Ranges

Some years ago the Department adopted a salary plan for all its employees—except those working in field maintenance operations—which incorporated most of the principles stated above. Consequently, the basic form of the existing schedule of salary ranges has been modified only slightly by the Consultants.

The recommended schedule of pay ranges is shown in Schedule A. This schedule consists of 40 salary ranges of five steps each. The rates—or steps—in each pay range provide an increase of approximately five per cent for each step. Thus, there is a spread of approximately 20 per cent between the minimum and maximum rates in each pay range.

The system of pay ranges as shown in Schedule A affords economic incentive for employees, as well as administrative flexibility—so operating officials can recognize differences in performance among employees whose positions are included in the same class. The desirability of a range of pay in each class, rather than a single rate for the class, is apparent when it is remembered that positions are allocated to classes on the basis of the nature of the work required, without reference to the qualifications of the individual or the quality of the work performed by the employee occupying the position.

A further advantage of the recommended schedule of pay ranges is that the pay plan may be adjusted to meet changing conditions affecting the level of compensation, without disturbing the basic salary structure or the relationships among classes. For example, if, at the time of a review of the pay plan, it is concluded that a general adjustment of five or ten per cent is desirable, the entire pay plan may be adjusted simply by increasing or decreasing, as the case may be, the rates of pay for all classes—without disturbing the relationships that exist among classes.

In Schedule B, the basic salary schedule is shown in approximate hourly equivalents of the monthly rates shown in Schedule A. The hourly rates are computed on the basis of a 40-hour work week, and will be useful where part-time or seasonal personnel are employed.

The Salary Survey

Since the Department must compete with other employers, both public and private, the compensation of its employees should be comparable to that paid by other employers. If a proper balance is not achieved in the Department's pay plan, the Department either will be unable to obtain qualified employees or its expenditures for wages and salaries will be greater than necessary. Moreover, information concerning prevailing wages and salaries in the labor market is useful in that it reflects the judgment of other employers concerning the pay relationships which should exist among different classes of work.

SCHEDULE A

Proposed Salary Ranges in Monthly Amounts

Salary Range Number	*Step A*	*Step B*	*Step C*	*Step D*	*Step E*	*Annual Equivalent at Maximum*
1	$ 230	$ 240	$ 255	$ 270	$ 285	$ 3,420
2	240	255	270	285	300	3,600
3	255	270	285	300	315	3,780
4	270	285	300	315	330	3,960
5	285	300	315	330	345	4,140
6	300	315	330	345	360	4,320
7	315	330	345	360	375	4,500
8	330	345	360	375	395	4,740
9	345	360	375	395	415	4,980
10	360	375	395	415	435	5,220
11	375	395	415	435	455	5,460
12	395	415	435	455	475	5,700
13	415	435	455	475	500	6,000
14	435	455	475	500	525	6,300
15	455	475	500	525	550	6,600
16	475	500	525	550	575	6,900
17	500	525	550	575	600	7,200
18	525	550	575	600	630	7,560
19	550	575	600	630	660	7,920
20	575	600	630	660	690	8,280
21	600	630	660	690	720	8,640
22	630	660	690	720	755	9,060
23	660	690	720	755	790	9,480
24	690	720	755	790	830	9,960
25	720	755	790	830	870	10,440
26	755	790	830	870	910	10,920
27	790	830	870	910	955	11,460
28	830	870	910	955	1,000	12,000
29	870	910	955	1,000	1,050	12,600
30	910	955	1,000	1,050	1,100	13,200
31	955	1,000	1,050	1,100	1,150	13,800
32	1,000	1,050	1,100	1,150	1,200	14,400
33	1,050	1,100	1,150	1,200	1,260	15,120
34	1,100	1,150	1,200	1,260	1,320	15,840
35	1,150	1,200	1,260	1,320	1,380	16,560
36	1,200	1,260	1,320	1,380	1,450	17,400
37	1,260	1,320	1,380	1,450	1,520	18,240
38	1,320	1,380	1,450	1,520	1,600	19,200
39	1,380	1,450	1,520	1,600	1,680	20,160
40	1,450	1,520	1,600	1,680	1,760	21,120

SCHEDULE B

Proposed Salary Ranges in Hourly Amounts

Salary Range Number	*Step A*	*Step B*	*Step C*	*Step D*	*Step E*
1	$1.33	$1.39	$1.47	$1.56	$1.65
2	1.39	1.47	1.56	1.65	1.73
3	1.47	1.56	1.65	1.73	1.82
4	1.56	1.65	1.73	1.82	1.91
5	1.65	1.73	1.82	1.91	1.99
6	1.73	1.82	1.91	1.99	2.08
7	1.82	1.91	1.99	2.08	2.17
8	1.91	1.99	2.08	2.17	2.28
9	1.99	2.08	2.17	2.28	2.40
10	2.08	2.17	2.28	2.40	2.51
11	2.17	2.28	2.40	2.51	2.63
12	2.28	2.40	2.51	2.63	2.74
13	2.40	2.51	2.63	2.74	2.89
14	2.51	2.63	2.74	2.89	3.03
15	2.63	2.74	2.89	3.03	3.18
16	2.74	2.89	3.03	3.18	3.32
17	2.89	3.03	3.18	3.32	3.46
18	3.03	3.18	3.32	3.46	3.64
19	3.18	3.32	3.46	3.64	3.81
20	3.32	3.46	3.64	3.81	3.98
21	3.46	3.64	3.81	3.98	4.16
22	3.64	3.81	3.98	4.16	4.36
23	3.81	3.98	4.16	4.36	4.56
24	3.98	4.16	4.36	4.56	4.79
25	4.16	4.36	4.56	4.79	5.02
26	4.36	4.56	4.79	5.02	5.25
27	4.56	4.79	5.02	5.25	5.51
28	4.79	5.02	5.25	5.51	5.77
29	5.02	5.25	5.51	5.77	6.06
30	5.25	5.51	5.77	6.06	6.35

Therefore, in order to develop an equitable wage and salary plan for the Department, it was necessary to learn the wage and salary levels that prevail in the labor market from which the Department obtains its employees. For many kinds of work this market is restricted to Montana. For other classes of work, particularly those of a professional or technical nature, the labor market encompasses a much larger area.

Pay Rates in Private Enterprise

Data concerning pay rates in private employment were obtained by means of a questionnaire which was sent to approximately 400 commercial, industrial and construction firms in Montana. In the questionnaire a number of types of positions in the Department, which might be expected to exist in the firms queried, were described. These included a number of clerical, fiscal, engineering, technical, labor and trades occupations. The requested information was submitted by approximately 150 firms, each with 50 or more employees.

To permit standardization of the data gathered—and to facilitate comparison of pay rates—the data gathered were converted to a straight 40-hour week for all positions. The range between the first and third quartiles—which represents the middle 50 per cent of the rates reported—was used as the prevailing wage practice.[1] The highest 25 per cent and the lowest 25 per cent of the rates were disregarded as representing extreme or non-typical pay practices. This method of summarization was used because it is subject to less distortion by unusually high or low pay rates than other methods.

In using such data in the development of a pay plan, it is necessary to keep several factors in mind. These are:

1. The pay data was submitted on the basis of very brief descriptions of the several types of work —and these were subject to varying interpretations.
2. There are significant differences in working conditions and other benefits from one employer to another. As a consequence, the summaries for the several classes of work should be used as general indications—rather than precise measures—of the pay practices of other employers.
3. The fewer rates reported for any particular type of work, the less reliance can be placed on the figures.
4. Labor and trades personnel in the public service frequently enjoy advantages over such employees in private industry in the form of greater continuity of employment and more liberal vacation and sick-leave benefits, and this must be considered in making wage comparisons between such jobs in private industry and those in the Highway Department.

Pay Rates in Public Agencies

In orde. to make comparisons with pay practices in other public jurisdictions, salary information was gathered from other state highway departments, several other State departments and the county road agencies in Montana. Such information was obtained from the highway departments in Arizona, Colorado, Utah, Idaho, Nebraska, Oregon, South Dakota, Washington and Wyoming. These data were summarized in terms of average minimum and average maximum salaries. Because of the lack of formalized classification plans in many of these states, comparisons between their positions and the classifications in the Montana Highway Department were made largely on the basis of comparable class titles which may not be equivalent in all cases.

All county road agencies were requested to provide pay information for road maintenance classes, which also was summarized in terms of average minimum and average maximum salaries—as were data received from the following agencies of Montana: the Game and Fish Department, the Unemployment Compensation Commission and the Welfare Department.

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[1] To arrive at the quartile computations, all the pay data received for each type of work were arranged in ascending order from the lowest to the highest. The first quartile (Q_1) is that rate below which 25 per cent of the rates fall and above which 75 per cent of the rates fall. The third quartile (Q_3) is that rate below which 75 per cent of the rates fall and above which 25 per cent of the rates fall. The median is the rate below which 50 per cent of the rates fall and above which 50 per cent of the rates fall.

SCHEDULE C

Proposed Salary Ranges By Classification

Classification	Salary Range Number
Clerical, Fiscal and Administrative	
Clerk I	3
Clerk II	7
Clerk III	9
Clerk IV	11
Clerk V	13
Right of Way Clerk I	13
Right of Way Clerk II	15
Clerk-Typist I	3
Clerk-Typist II	5
Clerk-Stenographer I	5
Clerk-Stenographer II	7
Clerk-Stenographer III	9
Administrative Secretary	11
Office Services Supervisor	13
Office Manager	17
Commission Secretary	24
Key Punch Operator Trainee	3
Key Punch Operator	5
Key Punch Supervisor	9
Tabulating Machine Operator I	9
Tabulating Machine Operator II	11
Tabulating Machine Supervisor	15
E.D.P. Programmer I	17
E.D.P. Programmer II	19
E.D.P. Supervisor	24
Timekeeper	13
G.V.W. Patrolman	11
G.V.W. Tax Supervisor	22
Safety Inspector	19
Personnel Technician	19
Assistant Training Officer	19
Training Officer	21
Engineer, Training-in-service	25
Personnel Director	24
Labor Contract Inspector	17
Labor Contract Supervisor	19
Public Information Technician	15
Assistant Public Information Officer	17
Public Information Officer	22
Research Analyst I	15
Research Analyst II	17
Highway Traffic Analyst	19
Assistant Planning Survey Manager	21
Planning Survey Manager	24
Accountant I	13
Accountant II	16
Accountant III	19
Accountant IV	21
Finance Director	24
Right of Way Agent I	13
Right of Way Agent II	15
Right of Way Agent III	17
Right of Way Agent IV	19
Right of Way Agent V	21
Right of Way Agent VI	24
Attorney I	17
Attorney II	21
Attorney III	24
Chief Counsel	28
Engineering and Related Technical	
Highway Technician I*	10
Highway Technician II	13
Highway Technician III	15
Civil Engineer I	17
Civil Engineer II	19
Civil Engineer III	22
Civil Engineer IV	25
Civil Engineer V	28
Civil Engineer VI	30
Civil Engineer VII	32
State Highway Engineer	—
Radio Technician I	13
Radio Technician II	17
Assistant Communications Supervisor	19
Communications Supervisor	22
Mapping Supervisor	19
Labor, Labor Supervision and Trades	
Janitor	7
Laborer	11
Highway Maintenanceman I	12
Highway Maintenanceman II	15
Heavy Equipment Operator I	13
Heavy Equipment Operator II	15
Powderman	13
Blacksmith	14
Carpenter	15
Painter	14
Sign Painter	16
Carpenter Foreman	17
Highway Maintenance Foreman I	16
Highway Maintenance Foreman II	17
Storekeeper	13
Weighman	13
Equipment Serviceman	12
Equipment Mechanic	14
Assistant Equipment Mechanic Foreman	15
Equipment Mechanic Foreman	17
Assistant Equipment Manager	19
Equipment Manager	24
Reproduction Machine Operator	9
Offset Press Operator	11
Photographer I	15
Photographer II	17
Reproduction and Photograpy Supervisor	19
Aircraft Pilot	19
Chief Aircraft Pilot	21

* Persons employed in this class on a part-time or seasonal basis shall start at $345 per month.

Development of the Proposed Salary Plan

Historically, a distinction has developed in the Montana Highway Department between the pay practices and related fringe benefits of employees engaged in field maintenance operations and those which apply to employees engaged in professional, administrative and clerical work. As a result, inequities and inconsistencies have developed which should be corrected. As an enlightened and responsible employer, the Highway Commission should strive toward the establishment of equitable and consistent pay practices and personnel policies which apply to all of its employees. However, in view of the strong precedents and contractual agreements which govern these matters, this may well be a long and difficult process.

As indicated previously, the adoption of a systematic and equitable pay plan is of central importance in this process. In Schedule C the proposed pay plan to cover all employees of the Department—and which includes the recommended ranges of pay for each class of positions in the classification plan—is presented.[2] Since somewhat different considerations have influenced the recommendations with regard to the two groups of employees mentioned above, these groups are dealt with separately in the following sections.

Professional, Administrative and Clerical Employees

In developing the proposed pay plan as it pertains to professional, administrative and clerical employees, three factors were taken into consideration: (1) the pay practices of other employers, (2) the changes being recommended in the organizational structure and (3) the present pay practices in the Department.

Analysis of the pay data gathered during the survey indicated that the pay practices of the Department vary considerably from those of the private and public employers from whom data were received. The areas of discrepancy (and comparability) were:

1. Salaries paid to clerical and lower-level technical employees are — in general — greater than those paid by other employers.
2. Salaries paid lower-level and middle-level professional and administrative employees compare favorably with prevailing pay practices of other employers.
3. Employees occupying the principal engineering positions in the Department are paid less than the incumbents of comparable positions in other highway departments included in the survey.

As a consequence of the above factors, the proposed pay plan does not contain many upward adjustments in the lower- and middle-salary levels. It does contain a number of upward adjustments in the principal engineering positions.

The proposed pay plan was designed to fit the recommended organization plan and structure as described in Chapter Two, under the assumption that the proposed organizational changes would be made as soon as possible. However, should it be decided by the Commission that the proposed pay plan be adapted to the existing organization, some relatively minor changes would have to be made in the pay plan before this could be satisfactorily accomplished. One such change would involve the development of an additional civil engineering classification to accommodate positions eliminated by the proposed organizational changes. It also would be necessary to reallocate some positions to classifications other than those to which they are allocated in the proposed pay plan. Should the decision be made that the pay plan be adapted to the existing organization, the Consultants will make the necessary revisions and submit them in a supplementary report within 30 days from the date notified of such decision.

In recognition of the present pay practices of the Department—and the commitments which these practices represent to present employees—no pay adjustments have been recommended which would result in a lower salary for any positions or employees. This will mean that, in the years ahead, the Department should follow a policy of granting *selective* wage increases where wage survey data and meritorious performance indicate they are warranted, until the pay practices of other employers have "caught up" to those in the Department. Such a policy is preferable to any attempt to achieve salary comparability by reducing wage ranges or rates now.

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[2] Schedule C lists only the job classifications and the salary range number for each classification. To determine the rates of pay for each classification, correlate the salary range number in Schedule C with the same number in Schedule A. In addition to these schedules, additional data on the proposed pay plan are contained in the supplement to this report.

Field Maintenance Employees

Analysis of the pay data gathered during the survey indicates that the pay received by field maintenance employees in the Department is consistently higher than that paid by other highway departments in the region and by county road agencies in Montana. The pay of these employees also compares favorably with that received by employees in similar jobs in private firms—many of whom are subject to seasonal or other layoffs and whose fringe benefits are more limited than those of Department employees. As a matter of fact, the rates paid by the Department for unskilled labor substantially exceed the prevailing rates paid by both public and private employers. In view of these facts, no general upward adjustment in rates of these employees has been made.

As mentioned above, a completely separate set of pay practices and related benefits presently apply to field maintenance employees as contrasted with other employees of the Department. These practices, which have been arrived at through collective bargaining and are incorporated into a formal contract, provide for some 40 distinct types of work and 15 separate rates of pay—some of which differ from one another less than five cents per hour.

This pay plan, with its multiplicity of job titles and pay rates, has become very complex and cumbersome to administer and no longer serves the best interests of either the Department or its employees. The practice of having this type of wage agreement with the field maintenance employees, while following entirely different pay practices for other employees, is reminiscent of the distinction made by many industrial employers between "white collar" and "blue collar" employees. While there may have been some valid reason for making such a distinction in the past—such as differences in the permanence of employment and other benefits, this distinction has become all but meaningless.

The proposed pay ranges for the new maintenance classifications are presented in Schedule C. These recommended pay ranges are taken from the same schedule of monthly rates (Schedule A) which was used for other classes of work in the Department. However, these ranges contain *three pay steps rather than five steps as for other classes of work.*[3] This was done in recognition of the pay practices in private industry—which typically provide shorter pay ranges for labor and trades positions—and because the additional knowledge and skill which can be gained through additional experience on these jobs is more limited. Monthly, rather than hourly, rates are provided because field maintenance employees are—for the most part—full-time, year-around employees just as are most other employees of the Department, and it would seem logical to pay them on the same basis. If for any reason it is necessary or desirable to use hourly rates, these have been provided in Schedule B.

The fact that there is a formal contract between the Department and the field maintenance employees will necessarily delay the adoption of these recommendations until the current contract period ends. However, these recommendations can and should form a basis for discussion and agreement at the next and succeeding bargaining sessions.

Adoption and Application of the Proposed Pay Plan

As stated above, the recommended ranges of pay for each class of positions in the classification plan are shown in Schedule C. It is intended that the proposed pay plan should be interpreted and applied as indicated below:

1. The proposed ranges of pay are intended to be gross compensation for full-time employment in the several classes.
2. The minimum rate of each range should be the normal entering rate. Deviation from this may be permitted if necessary to fill a vacancy or in recognition of exceptional qualifications of a candidate. However, if there is difficulty over any extended period in recruiting at the minimum rate, the pay range for that class probably should be adjusted.
3. Upon completion of a probationary, or working, test period, the employee should be advanced to the second step of the range for his classification. Employees who demonstrate continued capable service should be advanced to succeeding steps within the range at annual, or other, intervals as determined by the Commission. Employees who fail to maintain this level of performance should be denied advancement to higher steps.

In order that the proposed pay plan may be placed in operation on a logical and equitable basis, the following policies should be adopted in the initial application of the plan:

[3] Shown in the supplement to this report.

1. The salary of any employee whose present rate of pay is below the recommended minimum for the class to which his position is allocated should be increased to the new minimum on the effective date of the plan.
2. The salary of any employee whose present rate is between the minimum and maximum rates of the proposed range, but not at one of the established steps, should be increased to the next higher step on the effective date of the plan.

Continuing Wage and Salary Administration

If the proposed classification and pay plans are to be of continuing value to the Department, wage and salary administration—on a continuing basis—must be emphasized. A major prerequisite to effective wage and salary administration is the assignment of definite responsibility and authority for such activities to the Personnel Branch of the Bureau of Administration. Such an assignment of responsibility is a key factor in replacing the existing multiplicity—and sometimes inconsistency—of personnel practices with a logical, well-planned and consistent personnel program encompassing all employees of the Department.

A major task of the Personnel Branch—in fulfilling its responsibilities in respect to personnel administration, including wage and salary administration—is the preparation of a set of operating policies, procedures and rules to govern the conduct of personnel activities in the Department. The development of these would be partial implementation of the recommendation made in Chapter One regarding the development of operating policies and procedures for the Department.

With specific reference to wage and salary administration, it will be necessary to review the pay plan periodically and make adjustments to reflect changes in living costs, labor market conditions, employee recruiting experience and related factors. A sound procedure would be to conduct a general review of the pay plan annually, preferably immediately prior to the development of the annual budget.

Step or Incremental Increases

It appears appropriate to comment at this particular point on the prevailing practice of granting incremental, or step, increases each year to employees whose performance has been evaluated as satisfactory. The comments in regard to this practice are made in relation to the following factors:

1. The prevalence—in public organizations of all kinds—of the practice of granting annual increases for satisfactory performance.
2. The relationship of the practice to performance appraisal.
3. The granting of merit increases.

In the first instance, it should be recognized that the practice of granting incremental increases, each year, to employees whose performance has been satisfactory is quite prevalent in all types of governmental organizations. In large part, this practice has developed during the past two decades to meet the upward secular trend in living costs. In effect, the practice—in general—is to grant such increases "across the board" to employees whose performance is rated satisfactory.

As this practice has increased employees, by and large, have come to expect the annual raise and —in general—tend not to consider it in relation to merit. As a result, supervisors at all levels in organizations have experienced pressures to accord "satisfactory" ratings to their subordinates. A considerable pressure on particular superiors is that which results from the knowledge—in many instances, at least—that fellow supervisors quite generally attempt to get raises for their subordinates. Thus, the supervisor who is overly particular in his ratings risks becoming known as a supervisor "who doesn't fight for his boys"—and may lose cooperation of the latter. Consequently, when appraisals are directly related to salary adjustments, attention tends to be focused on this aspect and supervisors generally tend to rate all subordinates the same.

Top management generally subscribes to the notion that increases in salary should be granted on the basis of performance. However, if a policy that increases shall be granted only on the basis of merit is instituted, the result often has been that supervisors' ratings of subordinates' performance become consistently "above standard," although the performance has not improved. Therefore, it appears that some approach—other than a policy simply stating that increases "shall be based on merit" is needed to assure that performance is adequately rewarded.

One approach that has met with success, and which it is recommended that the Department adopt, is as follows:

1. The Department should face the fact that the practice of granting annual increases for satisfactory performance is prevalent in government organizations and, at least so long as the secular trend in the cost of living is upward, the practice probably will have to be continued.
2. Each year the Department should determine how much money it wants to grant (1) for annual increments (for satisfactory performance) and (2) for merit increases for better than satisfactory performance.
3. A policy should be established that only a certain percentage of the employees can be granted merit increases—based upon analyses by the Personnel Branch of performance appraisal records (as recommended in Chapter Three). For example, the policy might state that only one-third of the employees of each unit would be granted merit increases. The percentage might change from year to year.
4. There should be strong top management support, by policy, of performance appraisal by superiors at each level. The appraisal system described and recommended in Chapter Three should be developed and practiced—*with emphasis upon its utilization as a tool for developing subordinates* rather than upon salary adjustment (formal appraisals need not, and should not, be made at the beginning of budget preparation or at the normal time for granting increases).
5. There should be continuing emphasis upon satisfactory performance as the basis for granting the cost-of-living increment.

In effect, this method recognizes the desirability of annual cost-of-living increments for satisfactory performance, and provides for merit increases for better than satisfactory performance. It also provides for denial of either increase in the event performance is not satisfactory.

Overtime Pay

The diversity which characterizes the pay practices of the Department also extends into the area of overtime compensation. Four distinct overtime practices presently apply to different groups of employees. These are:

1. Hourly-paid employees engaged in field maintenance activities are paid at the rate of time and one-half for all overtime worked—except on holidays, when double-time is paid.
2. Monthly-paid maintenance employees and higher-level administrative and professional employees are not compensated in any manner for working overtime.
3. Right of Way Agents, Instrumentmen, Bridge Inspectors, Project Engineers and Resident Engineers are granted additional compensation ranging from 20 to 30 dollars per month for devoting extra time, as required, to their work.
4. All other employees of the Department are paid straight time or are given compensatory time off for all overtime worked.

As might be expected, such a variety of practices regarding such a basic matter as overtime pay has given rise to a number of problems. First, and perhaps most obvious, is the basic inequality of treatment of the various groups of employees which is inherent in these diverse practices. However, even more serious from an operational viewpoint are the numerous instances of hourly-paid maintenance employees receiving *greater monthly and annual earnings than their monthly-paid supervisors.* Also worthy of note are the hazards associated with the payment of flat sums for overtime which may have little relation to the overtime hours actually worked. Finally, when the premium pay for overtime which is enjoyed by hourly-paid maintenance employees is viewed in conjunction with the practice of providing such employees with work on a year-around basis, it is difficult to avoid the conclusion that the Department is suffering the disadvantages inherent in both the hourly and monthly pay systems without gaining the advantages of either.

While premium pay for overtime is common for hourly-paid employees in private industry, it is customary to lay off such employees whenever the workload declines. On the other hand, monthly-paid employees often have greater assurance of continuous employment but no provision for premium

pay for overtime. The practice of granting premium pay for overtime and at the same time providing year-around employment for the hourly-paid maintenance employees provides very liberal annual compensation to these employees, but also results in rather high costs to the Department.

As is the case in salary practices, the several methods of compensating overtime have developed over a considerable period of time and are, in some instances, incorporated into collective bargaining agreements. Therefore, it is neither practical nor desirable to think in terms of immediate changes which would bring complete uniformity to practices in this area. However, it is timely for the Department to review its overtime practices and determine how they can be made more consistent and more in keeping with the interests of the Department, even though accomplishment may, of necessity, be a long-range objective.

In arriving at a new overtime policy, one of the first determinations which must be made is which employees should be compensated for overtime and which should not. Most organizations, whether private or governmental, make such a distinction at some point in their salary plan.

There are several reasons for making such a distinction. The more important are:

1. At some point in the hierarchy of administrative and professional positions the incumbent of the position is expected to perform the duties required without additional compensation, even though it may be necessary to work overtime on occasion.
2. It is possible for many employees in middle- and higher-level positions to control their own hours of work to a considerable degree and thus avoid working overtime. For example, a Project or Resident Engineer may supervise one or more projects where contractors are working overtime and still be able to schedule his own hours in such a way as to avoid an undue amount of overtime.
3. There is obvious hazard in compensating employees for overtime who have been delegated responsibility for authorizing overtime, since these economic incentives would tend to encourage the scheduling of overtime work.

A point of demarkation usually is made in terms of a specific salary level or range which applies throughout the organization or company. In the proposed salary plan this could be done merely by designating a certain salary range above which no compensation would be given for any overtime worked.

Another basic factor to be considered in developing an overtime policy for the Department is the fact that the very nature of both construction and maintenance work is such that there are "peaks" and "valleys" in the workload. In construction operations contractors often schedule double shifts, which require that Department inspection personnel work longer hours. On the other hand, contractors' work may be interrupted by weather conditions and result in shutdowns.

In maintenance work, uncontrollable fluctuations in workload occur during all seasons. In Montana the problem of scheduling such work is particularly difficult during the winter season because of the frequency of storms which make the workload particularly erratic.

These fluctuations in workload have caused some highway departments to adopt a "guaranteed annual wage" type of overtime plan. Under such a plan the overtime hours worked by each employee during the periods of heavy workload are recorded in an "overtime bank." Then these "banked" hours are taken off by the employee when his services are not needed. If it is not possible for the employee to take off all of his "banked" hours, the remaining hours are paid for.

Such a plan has a number of advantages, including the following:

1. It allows employees to draw regular salary checks throughout the year, even though the workload fluctuates markedly.
2. It allows the employing department to retain experienced employees on the payroll during slack periods without having to "make" work for them.
3. This plan is sufficiently flexible to cover all types of employment in almost any organization, thus eliminating inconsistent overtime policies for various groups of employees.

In the matter of overtime, as in other aspects of salary administration, there is need for developing a uniform policy which is tailored to meet the needs of the entire Department. In moving toward this objective, the "guaranteed annual wage" deserves serious consideration by the Highway Commission.

Another approach to solution of the problem of overtime pay has to do with the improvement of supervision and the effectiveness with which work is planned, scheduled and performed. This approach recognizes that there are seasonal fluctuations in workload that lead to overtime work. But it also rec-

ognizes the importance of seeking ways to avoid overtime work through better supervision, better planning and scheduling of work, the development of more effective methods of doing work and the better scheduling and utilization of both men and equipment.

A fundamental feature of this approach is emphasis upon the responsibility of supervisors at every level for the performance of their units. The maintenance function research project, mentioned in Chapter Four and further described in Chapter Six, is intended to provide a basis upon which to institute this approach.

The following chapter is devoted to the development of a program of action for the Commission and the Department—to implement the recommendations made in this report.

CHAPTER SIX

ACTION PROGRAM

It must be apparent that all of the recommendations made previously in this report cannot be put into effect at once. However, because all the recommendations are interdependent and interrelated there is need for a planned program of implementation. This chapter is directed toward defining a logical step-by-step undertaking of an action program for management improvement.

Step 1—Adoption of Recommended Organization Plan

It is recommended that the Commission and State Highway Engineer adopt, in principle, the recommended organization structure and plan described in Chapter Two. In taking this action it should be recognized that some of the changes and innovations can be effected and put into practice immediately. Others will take varying periods of time and, in some cases, considerable preparatory work before the recommendations can be made fully effective.

It is possible, for example, immediately to accept the concept of the five-bureau staff organization and the realigned field district organization. Some parts of both can be put into effect almost at once. It will, however, take some time for the State Highway Engineer, working with his Executive Committee (see Step 4), to evaluate and reassign personnel and to recruit additional personnel from outside the Department should they be needed to fully and adequately staff the proposed organization.

Step 2—Adoption of Definition of Commission-Department Relationships

The Commission and the State Highway Engineer should formally adopt the definition of Commission-Department responsibilities, authority, duties and relationships as described in Chapter One. The definition should be formally written. This statement then can become a part of the organization guide.

Step 3—Adoption of Definition of Relationships Between Headquarters Units and Field Units

The State Highway Engineer should formally adopt—with the concurrence of the Commission—the definition of the responsibilities, authority, duties and relationships of headquarters and field units as described in Chapter Two. This action will, in effect, clearly state that the operating philosophy of the Department is to decentralize authority—subject to control and policy direction and guidance—and that the organization is a line-and-staff type.

Step 4—Activation of Executive Committee

Even though all members ultimately to serve on the Executive Committee may not be designated immediately, this committee should be formed and commence operations at once. It should be used by the State Highway Engineer to assist in planning the various improvement activities to be undertaken. The members of the committee should actively participate in all aspects of the undertakings and provide guidance and support for them.

The State Highway Engineer and the Executive Committee should promptly begin to formulate, for approval of the Commission, the statement of basic goals and objectives of the Commission and the Department. The State Highway Engineer, with the assistance of the Executive Committee, also should work out a plan and schedule for undertaking all of the management recommendations. There should be provision for regular reviews of progress, and assistance as needed, by the Executive Committee to assure that the action program for management improvement will be advanced with all reasonable speed.

Step 5—Adoption of Recommended Pay Plan

The recommended pay plan—including the job classifications, pay schedules and job specifications should be adopted by the Commission, in coordination with the State Highway Engineer. This action will assure an improved pay and classification plan designed to meet the needs of the recommended organization plan.

It appears that the adjustments associated with the adoption of the recommended organizational plan, as outlined in preceding steps, will have been accomplished in ample time to permit effecting the pay plan on July 1, 1962, the beginning of the next fiscal year.

Step 6—Planning and Administrative Research Projects

The accomplishment of Steps 1 through 5 will provide a top-level management organization, and appropriate techniques, to assure continuing guidance and support for activities necessary to effect the recommended management improvement program.

As must be apparent, effective total accomplishment of the management improvements recommended, requires careful advance planning and research. To meet this requirement the Highway Commission, in one sense, is particularly fortunate—there are ample Federal funds available for planning and research.[1]

With the creation of the Bureau of Planning and Administrative Research, the following research projects should be undertaken with 1½ per cent highway planning funds.

Research Project No. 1
General Administrative Management Research

Purposes

1. To develop a continuing inventory of management and supervisory personnel related to present and future needs of the Department.
2. To develop a set of administrative and operating policies and procedures to guide operations and activities of the Department.
3. To develop an organization guide to define the functions and relationships of organizational units of the Department.

Scope

1. *Manpower Inventory*
   (a) The analysis will include all management and supervisory personnel and all professional and technical non-supervisory personnel who might have potential for future management assignments.
   (b) There will be developed all significant factual data on each individual, and a complete history of his education and work experience.
   (c) There will be an appraisal of the quality of each individual's present job performance, his potential for advancement and a determination of jobs for which he has potential — all through evaluations by supervisors.
2. *Operating Policies and Procedures*
   The analysis will include all basic Department policies and procedural directives, all functional policies and procedural instructions, and district policies and procedural controls.

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[1] It is understood that the present planning and research program of the Department does not nearly take up all available Federal funds earmarked for this purpose. While unused planning funds (close to $1 million) have been transferred to construction, in effect *the State is losing the funds* to the extent they are Interstate monies. Investment of these funds in needed research would be good business for Montana.

3. *Development of Organization Guide*
   The analysis and evaluation, and the resulting organization guide, will include all functional units in the central office and the major branches and sections of these units. In the field organization, there will be included District Engineers, Assistant District Engineers and other top functional supervisors.

Results

As a result of the research and analysis outlined above, there will be developed:

1. A comprehensive manpower inventory, forecast and appraisal system which will
   (a) Show needs for recruitment currently and in the future.
   (b) Provide the basis for planning the management personnel development process for the Department and for each individual supervisor or technical employee.
   (c) Establish standards of performance for each supervisory position in selected pilot areas of the Department, and a related appraisal procedure designed to facilitate and encourage the kind of superior-subordinate relationships essential to the process of development of people on the job.
2. A complete and comprehensive Department policy structure in a format designed to give adequate guidance and direction to all levels of the Department, an evaluation of existing *functional* policy and procedure manuals and the development of methods to facilitate maintaining up-to-date manuals.
3. An organization guide which will provide
   (a) A clear statement of the basic aims and philosophy of the Department.
   (b) An operating charter for each key position.
   (c) A minimizing of duplications of effort and provision of a basis for cooperative endeavor on a logical and consistent basis.
   (d) A clear definition of lines of authority and communication.
   (e) A clear definition of the responsibilities and accountability of each key position.
   (f) A sound basis for over-all organization planning.

Project Organization

1. A project supervisor should be assigned in the Bureau of Planning and Administrative Research to take responsibility for carrying the project forward. He should be a competent research individual, preferably one familiar with the Department and its operation.
2. The Executive Committee should assume responsibility for providing review and counseling as the project progresses.
3. In carrying the project forward, utilization should be made of the facilities and records in the Personnel Branch and other branches of the Bureau of Administration—with the view of having the inventory and forecasting procedures taken over by the Personnel Branch upon completion of the research project.

Research Project No. 2
Maintenance Function Research

Purpose

To conduct a thorough research evaluation of maintenance planning, scheduling, operations, reporting and control procedures as the basis for

developing such modifications or innovations as will assist field supervisors, maintenance staff and top management in attaining high quality maintenance with economy.

Elements of Project

1. *Analysis of records to determine trends in maintenance function and to get general measure of work load.*

   This will provide a foundation record of factual data attainable from existing records. The trends will be related to the past development of the state highway system and the character and volumes of traffic served. There will be provided a basis for estimating future maintenance requirements, including significant changes in the character of maintenance operations.

2. *Analysis of existing reporting procedures.*

   This will evaluate current progress, fiscal and cost accounting reports. The effectiveness of the reporting procedures will be evaluated by analyzing individual report elements in relation to the report purpose.

3. *Review of procedures for planning and scheduling work and utilization of manpower, materials and equipment.*

   This will be a general review of established practices in relation to planning and scheduling work, and utilization of manpower, materials and equipment. The review will relate current practices and procedures to fundamental principles of management to indicate where modifications of current practice and procedure are needed.

4. *Analysis of individual maintenance work items by pilot production studies.*

   This will provide a detailed basis on which to analyze the work operation in selected maintenance items. It will be directed particularly at establishing procedures which will become a part of the continuing maintenance management process.

Results

1. *Outline of a procedure, based on the project research, for developing and using performance standards for planning and controlling maintenance activities.*

   This will involve establishment of work units that (a) are adapted to simple identification on the job as work is performed, (b) can be readily summarized and reported, and (c) result in performance standards that have real significance in planning and controlling the work. Recommendations will be made as to procedures for making fullest utilization of the basic work units and the performance standards as tools of management. This will include specific procedures for making analyses and reports in ways which will meet the needs of both the staff personnel and operating supervisors.

2. *Recommendations for continuing maintenance production studies.*

   Based on the pilot studies performed under research item 4 above, procedures will be defined for analyzing the complete maintenance operation associated with individual work items. It will give information on which to improve the existing methods through adjustments in scheduling, or in equipment and manpower assignments, and it will provide a basis for comparing alternative methods of doing the job.

3. *Presentation of a forecast.*

   This will define the magnitude and nature of the maintenance activity in the years ahead. It will present a forecast in terms both of work elements and of cost estimates. It will include recommendations for changes in policies and established procedures and present an appraisal of their potential influence on the forecast values.

Research Project No. 3
Highway Accident Research

Purpose

To provide measures of the safety value associated with the highway improvement program and to utilize available accident data as a guide to project priorities.

Scope

The research project will:

1. Correlate the historical records of accidents on the State-maintained highways with the adequacy ratings of the highways, using several past years' records.
2. Establish records of accidents by road sections, cumulative for periods of years so long as the structural condition and dimensions have remained unchanged.

Results

There will be provided:

1. A procedure for making full and continuing use of traffic accident records so they can be used most effectively for public information and improvement programming purposes.
2. Significant data reflecting the safety value associated with highway modernization programs.
3. A basis for defining most hazardous road sections as a guide to establishing priorities in the interest of highway safety.

Project Organization

1. A project supervisor in the Bureau of Planning and Administrative Research should be assigned responsibility for organizing and carrying forward the project.
2. A project guidance committee should be established to include the Director of the Planning and Administrative Research Bureau, another member from the Executive Committee, the Traffic Engineer, the Public Information Officer and one or two other representative management personnel.

Research Project No. 4
Continuing Highway Needs Inventory

Purpose

To provide long-range objectives for the highway improvement program and to furnish a guide for defining realistic short-range program schedules with adequate lead times for preliminary engineering and right of way acquisition.

Scope

1. The continuing needs inventory will cover separately the Federal-aid highway systems in Montana.
2. It will include current appraisals of the cost of overcoming critical deficiencies.

3. It will include measures of the rates of obsolescence and costs of improvements necessary to counter such obsolescence.
4. It will make projections of the costs of highway modernization based on statistical analyses of historical data.
5. It will include estimates of future funds from existing sources and the continuing obligations for administration and maintenance.

Results

The continuing highway needs inventory will:

1. Provide the basis on which the Highway Commission can establish long-range goals for highway improvement.
2. Allow the Highway Commission to establish short-range programs of three, four or five years with firmness and assurance of ample lead time for preliminary engineering and right of way acquisition.
3. Provide a basis for appraising the adequacy of existing financial provisions—State and Federal.
4. Provide measures of the capacity of the Highway Commission to accept additional roads for maintenance in light of the financial requirements for developing and maintaining roads already under State maintenance.

Project Organization

1. The Highway Planning Survey, as it is incorporated in the new Bureau of Planning and Administrative Research, should be prepared to take on the responsibility for the planning research activity.
2. The Executive Committee should provide guidance in determining how programs should be established for submission to the Highway Commission as short-range programs for project scheduling purposes.

Guidance for Undertaking the Action Program

In setting up the foregoing planning and research projects, it will be necessary to build up a staff for the Bureau of Planning and Administrative Research. Some of the needed personnel probably can be selected after careful review of qualifications and interests of individuals now employed in the Department. Others may be recruited from outside the Department.

In the process of building up the bureau and organizing and carrying forward the several research projects, the Department undoubtedly would find it helpful to have the expert assistance and guidance of a consultant specifically engaged for this purpose.

By engaging a consultant, it would be possible:

1. To initiate the research projects promptly.
2. To train and develop research personnel as the work progresses.

Agreement for the use of a consultant specifically should provide for *guidance and assistance* to the Bureau of Planning and Administrative Research and *not* for the consultant to do the specific research projects. This is emphasized because this approach—guidance and assistance—is more likely to accomplish the important and desirable results of:

1. Making the accomplishments of the research projects definitely the product of Highway Department endeavor, with the maximum possibility of having the full understanding and support of the Department.
2. Providing a training and development program for Highway Department research personnel, who should become continually more expert and qualified to carry forward an effective planning and administrative research program.